



**PhD in Psychoanalytic Studies**

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**Adolescent Twins' Mental Representations of Self  
and Other in Relation with Zygosity, Attachment  
Patterns and Psychological Disturbances**

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## **Declaration**

I, You Zhou, confirm that the work presented in this thesis is my own and has not been submitted for any other professional qualification. Where information has been derived from other sources, I confirm that this has been indicated in this thesis.

You Zhou

Date 15/04/15



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## **Abstract**

### **Introduction:**

Based on a theoretical integration of cognitive development psychology, psychoanalytic theory and attachment theory, Blatt and his colleagues formulated a systematic psychodynamic model of mental representation of self and other emphasizing internalization, differentiation and integration of self and object representations in normal and disrupted personality development. During the development process, adolescence is a critical transformational stage to determine either the construction of an integrated self-identity and more mature expressions of relatedness within a wider social context, or emergence or consolidation of many forms of psychopathology. This study used a twin design to examine the degree of articulation, differentiation and integration of representation of self and representations of self and parents in mid-adolescence in order to estimate the role of the environment and of genes in individual differences in these representations.

### **Method:**

This study used 160 twin pairs including equal numbers of monozygotic and dizygotic twins reared together to examine the degrees of genetic and environmental influences on mental representation in adolescence. Representations of self and other were assessed using an adapted measure of the Differentiation-Relatedness Scale. The estimates of heritability of mental representations were calculated using model-fitting analysis.

### **Results/Discussion:**

There were indications of approximately 38% heritability in mental representation of self-mother and 28 % in representation of self-father. The remainder of the variance was attributed to non-shared environmental influences and possible measurement error with no effect of shared environmental influences. No genetic influence or shared environmental influences was found in self-representation. Different pathways were discussed to interpret the results, which suggested complex gene-environment interactions at play affecting the levels of mental representations in adolescence. Furthermore, the mechanisms involved in representations of self and other in adolescence were compared and contrasted with attachment security, which may potentially provide us a fuller understanding of the links between childhood experiences and the development outcomes of cognitive, affective and interpersonal dimensions in personality development.

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## **PART I INTRODUCTION AND LITERATURE REVIEW**

## **Chapter 1 Interpersonal Relatedness and Self-Definition in Personality Development and Psychopathology**

### **1.1 Introduction**

Consistent with personality theories across a wide variety of disciplines, Blatt's two-polarities model contends the centrality of interpersonal relatedness and self-definition in normal and disrupted personality development (Bakan, 1966; Blatt, 1974, 1990, 2008; Freud, 1930; Wiggins, 1991). The polarities of interpersonal relatedness and self-definition refer to the two fundamental developmental processes in personality development as individuals strive to develop mature, mutually satisfying, empathically attuned and reciprocal interpersonal relationships as well as establish a differentiated, integrated, consolidated, realistic and essentially positive sense of self from infancy to senescence (Blatt, 2008).

Within the range of theoretical formulations of personality development, most theorists have emphasized either the self-definition dimension of separation, individuation and identity, or the relatedness dimension of attachment and interpersonal relationships in individual's psychological development. The majority of proponents of the self-definition theories are consonant with Sigmund Freud's view on the centrality of ego maturation in personality development (e.g. Blos, 1979; Freud, 1965, 1974; Mahler, 1972; Settlege, 1980). The psychological development therefore is mainly considered a process of separation and individuation through which individuals strive toward differentiation, autonomy, independence, achievement and identity formation to become separate and self-contained. As the theoretical emphasis is on the evolving differentiated and independent self, the establishment and maintenance of positive relationships with others are viewed either with relatively little recognition or in the form of a secondary product with the primary function of facilitating the development of the self (Blatt, 1995; Blatt & Blass, 1992). However, object relations theory (e.g. Fairbairn, 1952; Guntrip, 1992; Winnicott, 1960) as well as attachment theory (e.g. Bowlby, 1969; Grossmann & Grossmann, 1991; van Ijzendoorn, 1995) have been largely focused on the interpersonal relatedness dimensions of personality development that are prior to the development of the self. For instance, it is strongly advocated by

attachment theorists that personality development occurs not within an individual *per se*, but in the quality of self-other relationships experienced and perceived (Blatt, 2008; Blatt & Blass, 1990). In other words, relatedness with others and the themes of dependency, care, affection, intimacy and reciprocity are considered the hallmarks of personality development. The development of self is considered a necessary by-product of the primary process of developing increasingly mature and positive relationships (fuller reviews see Blatt & Blass, 1990; Blatt & Blass, 1996).

Given the two major theoretical perspectives mentioned, the majority of personality development theorists prioritize either one or the other of the two fundamental dimensions of self-definition and interpersonal relatedness. Blatt's polarities model is one of the few theoretical approaches that not only emphasizes the centrality of both the relatedness and self-definition dimensions in personality development, but also maintains that the relationships between these two developmental lines go beyond parallel processes or a simple interaction (Blatt & Shichman, 1983). This chapter will elaborate on the theoretical formulation of Blatt's two-polarities model of normal and disrupted personality development followed by a review of various factors that could influence the fundamental dimensions of interpersonal relatedness and self-definition. The last section of this chapter will focus on certain limitations of Blatt's model.

## **1.2 Blatt's Two-Polarities Model in Normal Personality Development**

According to Blatt's theoretical approach, the developmental line of relatedness is to develop *increasingly mature, reciprocal and mutually satisfying interpersonal relationships*; on the other pole, the developmental line of self-definition is to develop an *increasingly differentiated, integrated and consolidated self-concept and identity* (Blatt & Blass, 1990; Blatt & Shichman, 1983). These two developmental lines proceed in interrelated simultaneous ways, where the progress in one dimension facilitates the development in the other (Blatt, 1990; Blatt & Blass, 1990; Blatt & Shichman, 1983; Jordan, 1986; Miller, 1984; Stern, 1985; Surrey, 1985). Meaningful and satisfying relationships nurture the evolving sense of self, and in turn, an increasingly differentiated and integrated self contributes to the continuing development of more mature interpersonal relationships (see *Figure 1.1*). The mutually facilitating

transactions between these two fundamental dimensions of personality are outlined below in terms of the theoretical approach to the development of mental representation of self and other as well as the reformulation of Erickson's psychosocial development theory (Erikson, 1950, 1959, 1964, 1968). In a broader view, this specification of this interactive developmental process of the two polarities provides a systemic psychodynamic structural framework for establishing conceptual continuities between personality development, variations in normal personality organization, concepts of psychopathology and some mechanisms of therapeutic change (Blatt, 2008).

### **1.2.1 The Development of Mental Representation of Self and Other**

The concept of mental representation is a broad theoretical term widely used in developmental psychology. Across disciplines, it is recognized as object representations in psychoanalysis (Blatt, 1974, 1990; Blatt, Wild, & Ritzler, 1975; Kernberg, 1976; Kohut, 1971; Loewald, 1962, 1978; Mahler, Pine, & Bergman, 1975; Sandler & Rosenblatt, 1962; Stern, 1985), internal working models in attachment theory (Ainsworth, 1969; Bowlby, 1988; Bretherton, 1985; Main, Kaplan, & Cassidy, 1985), and cognitive-affective schemas in cognitive science (Fiske & Taylor, 1984; Horowitz, 1972; Markus, 1977; Westen, 1991a). Within different theoretical contexts, the term mental representation yields a range of meanings and compositions accordingly. The broad reference to the term often becomes a source of confusion and debate even within psychoanalysis (Beres & Joseph, 1970a). One of the integrative and comprehensive definitions of mental representations is provided by Zelnick and Buchholz (1990b), in which mental representations are defined as unconscious organizing structures of interactions. In a brief summary, mental representations are constructed from and forged in dyadic exchange between the infant and the environment, and operate spontaneously out of our awareness providing the models for the integration of current experiences with past representation as well as with affect (Zelnick & Buchholz, 1990b).

It is beyond the scope of this thesis to review the divergent meanings and contents of mental representation in psychoanalytic literature (see Beres & Joseph, 1970a; Zelnick & Buchholz, 1990b). The conceptualizations can vary from the internal perceptions of external reality such as related to the dynamics of drive and the gradual differentiation

of self and object representation (e.g. Bálint, 1943; Jacobson, 1964; Novey, 1958), the system of information gathering, identification and introjection constructed by ego (Sandler & Rosenblatt, 1962), to application of Piaget's theoretical notions of representational schemas regarding inanimate objects to infant's interpersonal object relations (Behrends & Blatt, 1985; Fraiberg, 1969). For instance, in more traditional psychoanalytic view, Beres and Joseph (1970a) defined mental representation as "a postulated unconscious psychic organization capable of evocation in consciousness as symbol, image, fantasy, thought, affect or action" (p.2). According to their definition, the contents of mental representation include representations of relationships within the object world that are not restricted to object relations.

The concept of Internal Working Models (Ainsworth, 1982; Bowlby, 1973, 1980; Bretherton, 1991; Craik, 1943; Main et al., 1985) is often considered theoretically similar to mental representation. The internal working models consist of a set of conscious and unconscious rules for the organization of information relevant to attachment and ideation (Main et al., 1985; p66). The theoretical emphasis of the construction of internal working models including a model of self is predominantly on the attachment relationship with the primary caregivers (see Chapter 2). The child's internal working models develop on the basis of perceived maternal availability and the working models of self and attachment figures further interact in a complementary way in the developmental process (Bretherton, 1985, 1991; Craik, 1943). Although the concept of internal working models is relevant to the psychoanalytic concept of mental representation, they differ in various theoretical aspects (see Chapter 2). In particular, as pointed out by Bretherton (1985), internal working models can be regarded as generalized representations of events experienced and the emphasis is exclusively placed on attachment figures and on attachment as the motivational force.

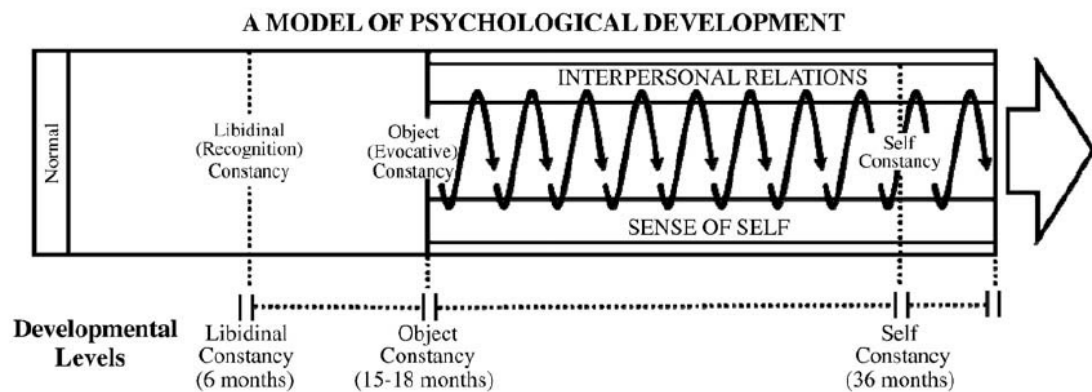
In cognitive science, Piaget's conceptualizations (Piaget, 1926; Werner, 1948; Werner & Kaplan, 1963) of children's development understanding of the inanimate world through representation of cognitive-affective schemas, assimilation and accommodation remain influential (Fiske & Taylor, 1984; Horowitz, 1972; Markus, 1977; Westen, 1991a). Moreover, a number of psychoanalytic theorists continue to apply Piaget's formulations to understand the interpersonal dynamics within the psychoanalytic field (Beebe, 1986; Beres & Joseph, 1970a; Stern, 1985). Blatt's two polarities model is one



of the applications of Piaget's notions which attempts to bridge psychoanalytic theory and the dynamics of interpersonal relationships. According to Blatt's theoretical view (1995), the development of cognitive-affective schemas in cognitive science for understanding inanimate objects (e.g. a toy in a neutral circumstance) has essentially similar developmental sequences as developmental psychoanalysis and attachment theories of how the child develops mental representations of self and others especially in primary caring relationships. The theoretical approaches may differ in the specification of the time at which a particular cognitive-affective schema may first appear, however they are consistent in their views of the infant as a capable and active partner in interactions with objects (Blatt, 1995).

*Figure 1.1* below presents a two-polarities model of self-definition and interpersonal relatedness in personality development based on the development of mental representation of self and other from early caregiving experiences. The mental representation of self and other emerges initially from the primary caring interpersonal relationship and subsequently stabilizes and unfolds as the child goes through a series of critical developmental stages. Further along the lifespan, the representations become relatively enduring internal structures that serve as templates to process, organize and guide individual's subsequent intrapersonal and interpersonal experiences (Blatt, 1974; Blatt & Lerner, 1983a, 1983b; Blatt et al., 1975). Within the two polarities model, Blatt and colleagues integrated psychoanalytic theories (e.g. Jacobson, 1964; Kernberg, 1976; Mahler et al., 1975) and the cognitive developmental theory of Piaget and Werner (Piaget, 1926; Werner, 1948; Werner & Kaplan, 1963) to propose that the cognitive and affective components of representations of self and other develop epigenetically in two independent but interrelated developmental lines of self-definition and interpersonal relatedness. The epigenetic nature of the development here refers to the developmental process that mental representations of self and others evolve from global, diffuse, fragmentary and inflexible earlier modes of representation to increasingly differentiated, accurate, empathetic and complex organized mental representational structures of self and other (Behrends & Blatt, 1985; Blatt, 1974; Blatt & Blass, 1990; Blatt & Lerner, 1983a; Blatt et al., 1975). In other words, Blatt's formulation emphasizes the dynamic as well as hierarchical sequence of the development of mental representation of self and other, in which higher levels extend and evolve from lower levels of mental representation in the normal personality developmental process.

**Figure 1.1 Two Polarities Model of Psychological Development** (cited from Luyten & Blatt, 2011)



Consistent with the object relations psychoanalytic approach and the attachment approach of infant development, the initial critical stage starts from the gradual formation of boundary constancy of an external object where in particular the infant is able to distinguish the physical form of a person from other objects in the embedding field and subsequently to respond or initiate interactions with the significant other (Mahler et al., 1975; Piaget, 1926; Werner, 1948). In the normal developmental process, at around 6 or 8 month (see *Figure 1.1*), the mental representational level of *recognition* or *libidinal constancy* (Fraiberg, 1969) emerges which enables the infant to differentiate and form particular affective bonds with significant others (i.e. primary caregivers) in contrast to other people in the embedding context (Ainsworth, 1969; Behrends & Blatt, 1985; Bowlby, 1969). The growing capacity to stabilize and consolidate the mental representation of the significant other at this stage prepares the infant for establishing an attachment bond with the primary caregiver at the next developmental stage of *evocative* or *object constancy* (Piaget, 1926; Werner, 1948; Werner & Kaplan, 1963).

As described in the developmental psychoanalytic theories (e.g., Mahler, Pine & Bergman, 1975), the term object constancy can refer to constant libidinal cathexis of the object (usually the mother) based on the perceived availability of the mother in representations. Similarly in attachment theory (Bowlby, 1969), evocative or object constancy allows the child to have the capacity to retain the sense of the attachment figure in the mind without her immediate physical presence. Fraiberg (1969), in

particular, reviewed various understandings of object constancy in psychoanalytic literature as well as in cognitive psychology, and attempted to draw the link between Piaget's ideas on (inanimate) object permanence and libidinal object constancy by the development of evocative memory at 18 months. However, the equating of libidinal object constancy to inanimate object permanence has also been criticized for overlooking their qualitative differences in the natural representational capacities within the context of mental representation (see Pine, 1974). Despite some of the criticisms, it should be noted that the quality of mental representation of the object is still the unitary necessary condition for the establishment of object constancy whether concerning libidinal cathexis or toleration of separation in the immediate absence of the object. Furthermore, at this stage, an initial and growing sense of self starts to emerge. Based on the perceived availability and consistency of the object or the attachment figure, the infant incorporates the worthiness of the self as deserving or able to obtain security and comfort from the attachment figure (Bowlby, 1969). For instance, an insecurely attached infant might start incorporating a negative working model of self as a result of previous attachment experiences of inconsistency or unavailability of the attachment figure. Thus, the stage of evocative or object constancy marks both the development of a stable sense of the object as well as the emergence of a stable sense of self.

In later development, around the age of 3, the sense of self becomes increasingly differentiated and consolidated, reaching the stage of *self-constancy*. In some other developmental views, such as longitudinal research in infant development (Sander, 1975), the stage of self-constancy occurs even as early as 2 years old. Based on emerged empirical research and observation of mother-infant pairs (e.g. Tronick, Cohn, & Shea, 1986), Sander (1975) described the mother-infant pair as an open biological system in which restoration of equilibrium develops within the mother-infant interactively environment exchange. Prior to the stage of self-constancy, Sander focused on activities rupturing and restoring coordination between mother and infant. As the infant has a new capacity to carry out intentionally destructive acts of aggression and the caregiver manages to tolerate aggression, a previously adapted equilibrium between mother and infant is restored as a key condition for experiencing self-constancy (Sander, 1975). In other words, the infant is able to realize the good self exists in continuity despite of his new capacities for aggression.

Further along the developing process, the concept of self and interpersonal relationships continue to unfold in mutually facilitating interactions passing through key cognitive developmental stages of *concrete operational thought* and *formal operational thought*, and finally arriving at *integrated* mental representations of self and other in mature adulthood. With the cognitive development of concrete operational thinking, a child develops the capacity for reversibility, transformation and conservation in recognizing different dimensions of objects at the age around 6 years old (Piaget, 1937). The newly emerged cognitive function allows the child to appreciate different perspectives on the relationship with the primary caregiver and prepares them to expand the interpersonal relationships in a relatively wider context. From the developmental psychoanalytic perspective, the development of concrete operational thought is consistent with the period of initial resolution of oedipal phase, in which the child begins to establish a triadic relationship with parents in comparison with the earlier separate dyadic relationship with each parent. The convergence of concrete operational thinking in the cognitive development and internalized oedipal emotional development facilitates the child's developmental transition from predominantly egocentric pleasure-seeking behaviours to the capacity for cooperation and collaboration with others (Erikson, 1950). The growing appreciation of the perspectives of others distinguished from his or her own further contributes to the increasingly differentiated and consolidated sense of self.

At the beginning of *formal operational thought* in early adolescence, the child develops the mental capacity for abstract, logical thinking, deductive reasoning as well as systematic planning and problem solving (Inhelder & Piaget, 1958). This particular developmental change is congruent with a critical shift in the mechanisms of development from internalization, identification to integration in psychoanalytic literature (Blatt & Blass, 1990) and attachment theories (Hesse, 2008; Main et al., 1985; Sroufe & Waters, 1977; Thompson, 1997), in which the advancement of cognitive capacity of bringing divergent aspects together at an abstract level allows adolescents to repudiate and assimilate childhood identifications from all previous developmental stages and to integrate them as a model for anticipating. The mechanism shift to integration in adolescence is further elaborated on by Erickson's Erickson (1968) formulations of psychosocial developmental stages, discussed in the following section and in Chapter 3, Section 3.2 regarding the characteristics of adolescent development.

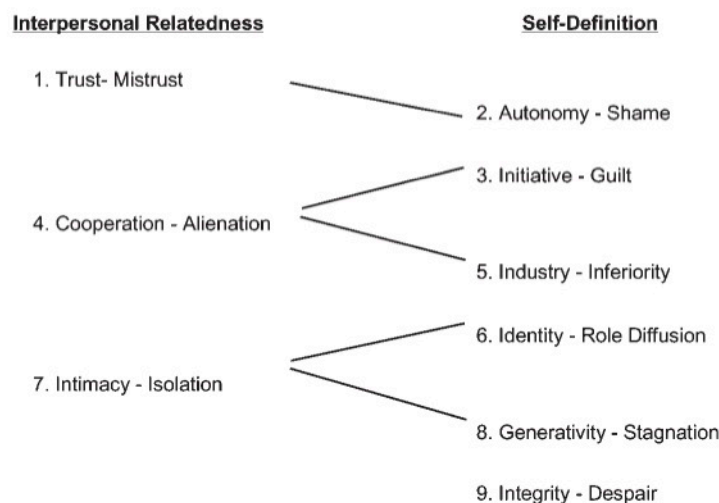
Furthermore, the growing ability to appreciate complex abstract internal psychological properties such as values and principles facilitates the further coordination and integration of various components of self and relatedness in a much wider interpersonal and cultural context. Further along the personality development process, the dialectical development of relatedness and self-definition continues to unfold as a new, more mature, synthesis progressing to adulthood (Blatt & Blass, 1996). This two polarities model of personality development (*Figure 1.1*) incorporating the cognitive-affective perspective of the development of mental representation could further be illustrated in the reformulated Erickson psychosocial development model discussed in the next section.

### **1.2.2 Reformulation of Erikson's Epigenetic Model of Psychosocial Development**

In terms of elaborating the dialectic synergistic transactions between self-definition and interpersonal relatedness in the two polarities model, Erikson (1959) provides a more comprehensive epigenetic model of psychosocial developmental stages outlining personality development. In his theory, Erikson (1968) used the term epigenetic to encompass the biological unfolding of the developmental sequence in his model. Individuals develop through unfolding and extending developmental outcomes as well as surrounding environmental and cultural influences that are predetermined by the previous developmental stage. In other words, the biological unfolding of personality development in the context of the social and cultural influences is in part determined by successful or unsuccessful resolution of the previous developmental stage (Erikson, 1968).

Erikson described individual's psychological development through a linear sequence of eight hierarchical stages, progressing from infantile dependency towards increasing individuation and separation (Erikson, 1950, 1959, 1964, 1968). Similarly to the Freudian psychosexual stages of personality development (Freud, 1905), Erikson's model also primarily emphasizes the antecedents and consequences of the attainment of individuation, in which the ultimate goal of development is self-identity consolidation (Blatt & Blass, 1990). However, he differed from Freud's approach of sexual drive theory in terms of the primary focus on ego development and the role of parental, social

and culture influences that contribute to personality development. In particular, interpersonal relatedness and social, cultural factors in Erikson's model are mostly considered as an imposed psychosocial crisis at each developmental stage that needs to be resolved by the ego at that stage and subsequently paves the way for the proceeding stages. By extending and elaborating Erikson's model, Blatt and his colleagues (Blatt, 1990; Blatt & Blass, 1990; Blatt & Shichman, 1983) were able to illustrate the transactions between the developmental lines of self-definition and interpersonal relatedness by bifurcating Erickson's eight hierarchical psychosocial stages (*see Figure 1.2*).



**Figure 1.2. The dialectical interactions of interpersonal relatedness and self-definition implicit in Erikson's psychosocial model** (Cited from Blatt & Blass, 1990; Blatt, 2008)

As illustrated in the diagram above, relatedness and self-definition both evolve through complex interactive developmental processes. The development initiates from the basic balance of *trust* versus *mistrust* in response to the quality of the primary maternal relationship in an infant's early life. Congruent with the object relations theory and attachment theories, the initial development of trust embedded in the earliest relationship nurtures the emergence of autonomy and independence of self at the second stage in a normal developmental process. Feelings of pride and worthiness accompanying the expression of a capacity for autonomy on the self-definition

dimension then progress to develop a capacity to initiate activity before proceeding to *cooperation and collaboration* on the interpersonal relatedness line (Erikson, 1950). The *cooperation (mutuality)* versus *alienation* is an additional stage incorporated into the developmental sequence between Erikson's phallic-urethral stage of *initiative* versus *guilt* and *industry* versus *inferiority* of latency (Blatt & Shichman, 1983). Around the age of initial resolution of the oedipal phase, a child gradually develops a growing capacity to cooperate and collaborate with parents and later starts to extend interpersonal relationships with same-sex peers (Sullivan, 1953). Following which, there is a continuing development of *industry* versus *inferiority* and *identity* versus *role diffusion* in the dimension of self-definition.

At this point, the identity versus role diffusion is a crucial time in adolescence where two developmental lines start to integrate into a comprehensive structure Erikson called self-identity (Blatt & Blass, 1990, 1996). The definition and elaboration of integration into self-identity in adolescence is further reviewed in Chapter 3 Section 3.2.2. In short, the components of previously internalized interpersonal relationship quality as well as the expressive modes of self and self-feelings are starting to integrate and merge into a single continuum, and eventually form a gestalt self identity (Blatt & Blass, 1990; Erikson, 1968). Subsequently, the interactions between the two developmental lines become more complex, as the new gestalt of self reflects a shift in the mechanisms of psychological development from internalization and identification to integration (Blatt & Blass, 1990, 1992, 1996). At the later developmental stages, the capacity to form self-identity funds the development of a more advanced capacity to form *intimacy* in interpersonal relatedness, which then proceeds to two more mature stages of *generativity* versus *stagnation* and *integrity* versus *despair* on the developmental line of self-definition to establish a more differentiated, integrated and consolidated self as well subsequently more mature expressions of relatedness in terms of mutuality and reciprocity.

In summary, the modified Erikson psychosocial developmental model fully illustrates the complex synergistic dialectical transactions between the fundamental polarities of interpersonal relatedness and self-definition in personality development. As described in this developmental process, the dimension of self-definition emerges from early experiences with the primary caregiver to a growing capacity for autonomy and

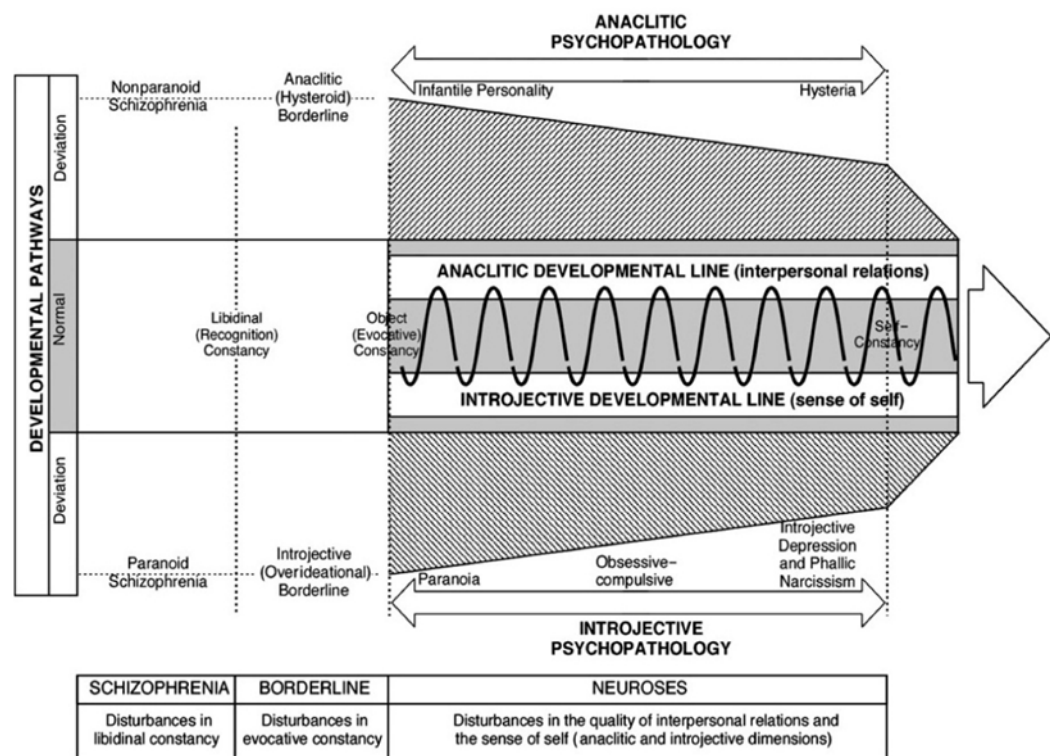
initiation which in turn contributes to interpersonal dimension of cooperation and coordination followed by an increasingly integrated self incorporating expressive modes of self and self-feelings at the industrious latency age and later on the emergence of individuality and self-identity in adolescence. Starting from this marked stage in adolescence, the development of relatedness and self-definition shifts from psychological process of internalization to integration and convergence of the polar opposites of *identity-role diffusion*, *intimacy-isolation*, *generativity-stagnation* and *integrity-despair*. Ultimately, personality development reaches the destined goal of establishing differentiated, integrated and consolidated sense of self as well as mature, mutually satisfying, empathically attuned interpersonal relationships (Blatt & Blass, 1990; Blatt & Shichman, 1983).

### **1.3 Interpersonal Relatedness and Self-definition in Psychopathology**

Following the two polarities model of normal personality development (*Figure 1.1*) in the previous section, various forms of psychopathology could be consequently viewed as determined by impairments of mental representational structure in disrupted developmental process (Blatt, 1991a). The mental representation of self and other is initially established in the earliest primary caregiving relationship with mother and proceeds to unfold throughout life cycle. As indicated by research studies in attachment (e.g. Ainsworth, 1969; Ainsworth, 1982; Bowlby, 1973; Bowlby, 1988; Bretherton, 1987; Main et al., 1985), disruptions of the early caregiving relationship can lead to distortions in the development of mental representational structure. Within the early interpersonal relationship context, when the perturbations continuously exceed a child's capacity to accommodate, mental representational structure of self and other, the developmental process may be compromised, which subsequently results in vulnerability to psychological disturbances in the personality structure (Blatt, 1991a; Bowlby, 1973; Bowlby, 1988). Although the impaired mental representation of self and other may be ameliorated or compensated by subsequent experiences in later life, some authors argue that the established early template or prototype is still more likely to determine subsequent development pathway as individuals tend to seek out experiences that are consistent with early modes of mental representation (e.g. Bowlby, 1973; Buss, 1987).



In *Figure 1.3*, the two polarities model of psychopathology integrates with the dialectic developmental process of interpersonal relatedness and self-definition in normal personality development, which provides a continuous perspective between normal and disrupted personality development as well as expressions of various psychopathologies. In the early development stage of boundary constancy, consequences of the failure to acquire the capacity for differentiating object from embedded context is highly congruent with much of the symptomatology of schizophrenia (Blatt & Wild, 1976). Lack of adequate boundary articulation can be expressed in hallucinations and delusion as well as disturbances in cognition, perception, attention, concept formation, and interpersonal relationships in schizophrenic patients (Blatt & Wild, 1976; Blatt et al., 1975). The inability to establish and maintain fundamental boundary distinctions outlines the characteristics of schizophrenic patients who find it difficult to differentiate self and non-self, inside and outside, as well as fantasy and reality. The self is often



**Figure 1.3 Polarities Model of Normal and Psychopathological Development** (cited from Blatt & Luyten, 2009)

experienced as fused or permeated with the physical presence of people or things in the environment. Thoughts and feelings may as well be perceived as amorphous and unbounded in a physically defined bodily self. Subsequently, interpersonal relatedness to schizophrenic patients can be experienced as severe disturbances (Blatt, Brenneis, Schimek, & Glick, 1976; Blatt, Schimek, & Brenneis, 1980). This relatively equivalent formulation of the characteristics of schizophrenia and the disruption of mental representational structure at early stage of boundary constancy is supported by extensive clinical investigations over years (e.g. Burnham, Gladstone, & Gibson, 1969; Federn, 1952; Freeman, Cameron, & McGhie, 1966; Lidz, 1973; Victor Tausk, 1992). Both are marked by impaired capacity to experience and form separation and differentiation between independent objects embedded in the context. Further illustrated by the varying degrees of emphasis on the dimension of relatedness and self-definition in *Figure 1.3*, schizophrenic patients can also be differentiated between paranoid schizophrenia and non-paranoid ones. Compared to non-paranoid schizophrenic patients, most paranoid schizophrenic patients can be characterized by exaggerated attempts, however failed, to preserve a sense of boundary between self and others defending against the threat of experiences of merger and fusion (Blatt & Wild, 1976).

In a similar manner, symptomology of borderline patients corresponds to disrupted developmental process in object or evocative constancy (Blatt & Auerbach, 1988; Blatt & Shichman, 1983). Although borderline patients may appear to function without apparent disturbances in a broader environmental structure, their deficits in evocative constancy become more transparent in an unstructured stressful situation (Arnow & Cooper, 1984; Blatt & Auerbach, 1988). Their inability to establish and sustain an enduring sense of self and a sense of relatedness with significant others during stressful moments manifests impairment in evocative constancy (Blatt & Auerbach, 1988). Thus, characteristics such as profound reactions to separation and loss, feeling of fragmentation or depletion of the self facing criticism and disapproval (Kohut, 1977), intense idealization and gross denigration, and exaggerated, overstated images and behavioural expressions could all be understood as patients' desperate attempts to maintain a cohesive and effective sense of self as well as a sense of relatedness to others (Adler & Buie, 1979; Kernberg, 1975; Kohut, 1977; Masterson & Rinsley, 1975).

As shown in *Figure 1.3*, between the stage of evocative/object constancy and self-constancy, personality development precedes as synergistic dialectical transactions between interpersonal relatedness and self-definition. Within a normal developmental range, a balance between interpersonal relatedness and self-definition marks the key feature of adaptive psychological functioning. The development of mental representation of self and other proceeds and unfolds in a hierarchal manner as outlined in Section 1.2. Variation in personality organization is largely attributable to individual's different emphasis on either one pole or the other, with distinctive forms of cognition, defence, and adaptation as well as unique qualities of interpersonal relationships and self-representation (*for a full review of polarities of personality organizations* see Blatt, 2008). In unfortunate circumstances, deviations in these normal development transactions can result in disturbances in qualities of interpersonal relationships and the sense of self. More specifically, severe disruptions at different levels of the normal dialectical developmental process can lead to a defensive exaggerated preoccupation with one of the polarities at the expense of the development of the other, which subsequently characterize emerged psychopathology (Blatt & Luyten, 2009). In other words, psychopathology can occur as a result of distorted modes of adaptation in attempts to maintain a balance between the two dimensions of relatedness and self-definition (Luyten & Blatt, 2011; Luyten, Mayes, Target, & Fonagy, 2012; Mikulincer & Shaver, 2007).

The theoretical conceptualization of fundamental dimensions of self-definition and interpersonal relatedness in personality development and psychopathology (e.g. Blatt, 2008; Livesley, 2001; Mikulincer & Shaver, 2007; Pincus, 2005; Skodol & Bender, 2009; Wiggins, 1991) provides a broad psychodynamic framework for integrating a wide range of personality organization as well as psychological disturbances. In addition, although it has not been reviewed here, this dynamic systematic approach of two polarities in viewing psychopathology also contributes significantly to understanding the nature of the psychotherapeutic process and the factors that can lead to therapeutic change (Blatt, 2008; Blatt & Ford, 1994). In a way, Blatt's two polarities model provides a systemic theoretical matrix for understanding psychopathology in continuity with the process of personality development, variations in normal personality organization as well as corresponding mechanisms in therapeutic actions.

Within the theoretical formulations, many psychopathologies can be organized into two clusters, termed as anaclitic<sup>1</sup> psychopathology and introjective<sup>2</sup> psychopathology.

Anaclitic patients are primarily preoccupied by concerns and conflicts around issues of interpersonal relatedness, as a result of exaggerated attempts to establish and maintain satisfying interpersonal relationships. As the central concerns for people with anaclitic psychopathology are feelings of closeness, dependence, and intimacy, the expressions of pathologies primarily focus on trust, affection, caring and dependability of others, and especially issues of intimacy as well as concerns about the capacity to give as well as to receive love (Blatt & Shichman, 1983). As a result, the excessive preoccupation of relatedness leads to disruptions of development of the self to a varying degree.

Therefore, people with anaclitic psychopathologies are mainly object-oriented varying from a lack of differentiation between self and other, to intense dependent attachment, and to disturbances in more mature, reciprocal and intimate relationships (Blatt & Luyten, 2009; Blatt, 2008). Anaclitic disorders, characterized by distorted emphasis on interpersonal relatedness, include pathologies such as undifferentiated (non-paranoid) schizophrenia, borderline personality disorder, infantile (or dependent) personality disorder, anaclitic (abandonment) depression, and histrionic personality disorder at different developmental levels (Blatt, 2008). In developmental terms of relatedness, at a primitive level, non-paranoid schizophrenia reflects issues of experiencing fusion and merge; at more intermediate level, intense fears of abandonment and neglect are expressed such as in symptoms of anaclitic depression and infantile personality disorder; and at a relatively more advanced level, conflicts of being able to give as well as to receive love characterize the central tension of histrionic personality disorder (Blatt, 2008).

The configuration of introjective psychopathology is characterised by preoccupations with issues of autonomy, self-control, self-worth, and identity, as a result of exaggerated attempts to establish a differentiated, integrated, and essentially positive sense of self. The basic desire of introjective patients is to define the self as a separate and different entity from others (Blatt, 1995; Blatt & Homann, 1992), with a sense of autonomy and

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<sup>1</sup> The term 'anaclitic' derives from Greek *anklitas* and it was taken by Freud (Levy, Blatt, & Shaver, 1998) to refer to *all interpersonal relationships that derive from dependency experienced in satisfying drives with the love object* (1905, 1917).

<sup>2</sup> The designated term 'introjective' was referenced by Freud (Laplanche & Pontalis, 1988; Webster, 1966) to describe *a processes whereby values, patterns of culture, motives, and restraints are assimilated into the self, consciously and unconsciously, as guiding personal principles through learning and socialization* (1917).

control, and feelings of self-worth and integrity. The central conflicts within introjective configuration involve fears of annihilation, intense feelings of inadequacy, inferiority, worthlessness, and guilt as well as uncontrollable affects, especially anger and aggression, toward others and the self (Blatt, 2008). Expressions of introjective psychopathology can range from establishing a primitive differentiation from others through exaggerated focus on separation, autonomy and control of one's body, mind and possession, to more internalized concerns about power and strength, sexual identity, and self-worth (Blatt & Shichman, 1983; Blatt, 2008). At different developmental levels, introjective disorders are manifested in exaggerated concerns about issues of self-definition, including forms of paranoia, obsessive-compulsive disorder, introjective depression and narcissism. In the paranoid form of introjective psychopathology, the distortion of dialectical development is at a more primitive level. Patients tend to use more primitive defences such as projection and splitting to establish boundary between self and others (Blatt & Wild, 1976) in exaggerated attempts to maintain self as a separate entity. At an intermediate developmental level, an exaggerated expression of control over one's body and mind is manifested within obsessive-compulsive disorder as using excessive behavioural and ideational control over symptoms. At relatively more advanced developmental levels, the exaggerated concerns about self-worth in issues of strength, power and accomplishments are more internalized and more likely to be expressed in introjective depression, or phallic narcissism (Blatt & Shichman, 1983; Blatt, 2008).

According to the model of anaclitic and introjective psychopathology, expressions of pathologies tend to cluster around one or the other configuration. However, there is a small group of patients presenting with intense and extreme preoccupation in both interpersonal relatedness and self-definition. In this particular group, the patients appear to lack well-articulated modes of adaptation and defensive organization, in comparison with patients within either of the two configurations (Blatt, 2008). According to research, the lack of a consolidated defensive organization in this mixed group appears to make the patients more vulnerable and distressed, however they show more significant therapeutic improvement in long-term intensive therapeutic intervention (see Shahar, Blatt, & Ford, 2003).

Theoretically speaking, the two configurations of psychopathology not only have distinctive basic instinctual focus (*libidinal* versus *aggressive*), but also differ in terms of basic defence mechanisms involved (see Blatt, 2008). Anaclitic patients tend to primarily use avoidant defences (e.g. denial and repression) while introjective disorders involve primarily counteractive defences (e.g. projection, intellectualization, reaction formation and over-compensation). The theoretical differentiation between the two primary configurations yields great value in understanding psychopathology in clinical practices particularly in studies of depression (e.g. Blatt & Maroudas, 1992; Blatt & Zuroff, 1992) as well as in studies of different responses to various aspects of therapeutic interventions (Blatt, Besser, & Ford, 2007; Blatt & Ford, 1994; Blatt, Ford, Berman, Cook, & Meyer, 1988a; Blatt, Zuroff, Hawley, & Auerbach, 2010). For instance, anaclitic depression is primarily characterized by feelings of loneliness, abandonment and neglect, whereas an introjective depression centres on feelings of failure, guilt and self-worth. The two distinguishable types of depression differ in current and early life experiences (Blatt & Homann, 1992), basic characteristic style, relational and attachment style (Luyten, Corveleyn, & Blatt, 2005), clinical expression and therapeutic response (Blatt & Zuroff, 2005; Blatt et al., 2010). The identification of distinctive anaclitic depression and introjective depression is very useful to understand some of mechanisms of the psychotherapeutic process, particularly the factors that can lead to therapeutic change. In other words, it can provide valuable information for effective intervention and prevention in future clinical practices (Blatt & Ford, 1994; Blatt, 2008).

In empirical studies, research evidence has also supported the formulations of two primary configurations of psychopathology (review see Blatt, 2004, 2008; Blatt & Zuroff, 1992). The predominant methodology in these studies is cross-sectional design using the Depressive Experiences Questionnaire in samples of adults (Blatt, D'Afflitti, & Quinlan, 1976) and adolescents (Blatt, Schaffer, Bers, & Quinlan, 1992). The questionnaire is a self-report measure developed from Blatt's two polarities model of self-definition and interpersonal relatedness. It includes 66 items with a 7-point scale under three constructs of dependency, self-criticism and efficacy to assess the ways in which individuals experience self and others within a range of depression related experiences. Consistent with the two polarities model, the Dependency factors of the measure examine the extent to which an individual invests intensely in significant

others for avoiding abandonment, whereas self-criticism assesses the degree of an individual's intense need for achievement to avoid feelings of inferiority and loss of self-esteem. The construct of efficacy is used to assess the feelings of competence. In the reliability and validity tests of the Depressive Experiences Questionnaire, subsequent research studies have reported the measure with high internal consistency and stable test-retest reliability (Zuroff, Igeja, & Mongrain, 1990; Zuroff, Moskowitz, Wielgus, Powers, & Franko, 1983; Zuroff, Quinlan, & Blatt, 1990). For instance, Zuroff and colleagues in their studies have reported that the personality traits of dependence and self-criticism in college students were stable over time with test-retest reliability of .80 for dependency and .75 for self-criticisms over a 3-month and 12-month period (Zuroff, Igeja, et al., 1990; Zuroff, Quinlan, et al., 1990). Furthermore, congruent with the two polarities model outlined in *Figure 1.3*, studies have suggested that the Depressive Experience Questionnaire is a reliable and valid measure for assessing both adaptive and maladaptive dimensions of self-definition and interpersonal relatedness, as the dependency factors were found to represent levels of maladaptive neediness and more adaptive relatedness (Blatt, Zohar, Quinlan, & Luthar, 1996; Blatt, Zohar, Quinlan, Zuroff, & Mongrain, 1995; Henrich, Blatt, Kuperminc, Zohar, & Leadbeater, 2001).

As described earlier, both anaclitic and introjective psychopathology can be viewed as an *exaggerated distortion of one developmental line to the neglect of the other*, as a result of *compensatory or defensive manoeuvres in response to developmental disruptions* (Beck, 1983; Blatt & Shichman, 1983; Meyer & Pilkonis, 2005; Mikulincer & Shaver, 2007; Pincus, 2005). Thus, from a psychodynamic developmental point of view, different forms of disorders can be regarded as dynamic conflict-defence constellations that attempt to maintain a balance, however distorted, between the fundamental dimensions of relatedness and self-definition, as opposed to mere static entities resulting from developmental deficits (Blatt & Luyten, 2009; Luyten & Blatt, 2011; Luyten et al., 2012). Despite their distinctive characteristics, anaclitic and introjective psychopathology are interrelated modes of maladaptation that occur in response to severe disruptions of the normal synergistic dialectical development of interpersonal relatedness and self-definition at different points in development. As illustrated in *Figure 1.3*, the formulation of the two configurations of psychopathology provides a psychodynamic theoretical framework for establishing conceptual continuities from normal personality development, to various forms of psychopathology

as well as the relationships among different types of disorders. Blatt's polarities model suggests that the more deviation from a balanced integration of relatedness and self-definition in normal personality development, the greater the exaggerated emphasis is placed on one developmental line at the expense of the other, and the more likely psychopathology is to occur (Blatt, 2008; Blatt & Luyten, 2009; Luyten & Blatt, 2011).

Furthermore, as the polarities model of psychopathology views that psychopathology occurs as a result of disruption or deviation in the normal dialectical developmental process of interpersonal relatedness and self-definition, it marks a significant shift in understanding psychopathology from symptom-based categorical diagnostic system to an etiologically based dimensional approach based on personality development and personality organization (Brown & Barlow, 2005; Clark, 2005; Luyten & Blatt, 2011). The theoretical formulation of two polarities in classifying and conceptualizing psychopathology is able to form a more cohesive and comprehensive theoretical basis for integrating the continuities between normality and psychopathology as well as for interpreting the complex relationships among different types of psychopathology. In this view, many types of psychopathology on both Axis I and II of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994) can be considered as exaggerated and distorted preoccupations, at different developmental levels, with one or the other of the two fundamental personality dimensions of interpersonal relatedness and self-definition. It has already been demonstrated in past studies that the two configurations of anaclitic and introjective psychopathology contribute greatly to the understanding of depression as well as the establishment of an empirically-derived taxonomy for diverse personality disorders in DSM Axis II (Luyten & Blatt, 2011).

Similarly, various Axis II personality disorders in the DSM-IV can also be clustered into the two primary configurations of anaclitic and introjective psychopathology (Blatt, 2008; Blatt & Luyten, 2010; Meyer & Pilkonis, 2005; also see Chapter 2 Section 2.4). According to systematic empirical investigations, it was found that individuals with a dependent, histrionic personality disorder have significantly greater concern with issues of interpersonal relatedness than self-definition, whereas individuals with paranoid, schizoid, schizotypic, antisocial, narcissistic, avoidant, obsessive-compulsive or self-defeating personality disorders tend to have significantly greater preoccupation with



issues of self-definition than with relatedness (Luyten & Blatt, 2011). Furthermore, within borderline personality disorder, distinctive anaclitic and introjective types were also identified (Blatt & Auerbach, 1988). This two polarities approach of classifying and conceptualizing psychopathology, and personality disorders in particular, is well in line with DSM-V Personality and Personality Disorders Work group's proposals for the revisions of the DSM-V, in which the central emphasis is placed on interpersonal relatedness and self-definition in understanding personality disorders (Skodol, 2011; Skodol & Bender, 2009). Although proposed revisions were not accepted for the main body of the DSM-V manual, they were approved as an alternative hybrid dimensional-categorical model included in Section III of the DSM-V (American Psychiatric Association, 2013). The inclusion of the new methodology may yield greater understanding of the causes and treatments of personality disorders in the research field as well as in the diagnosis and care of patients in clinical practice.

Overall, the two polarities model emphasizes the dynamic conflict-defence features of the two configurations of psychopathology including symptom disorders on Axis I and personality disorders on Axis II of the DSM-V. Various forms of psychopathology can be viewed as different maladaptive attempts to maintain some balance between relatedness and self-definition in response to early developmental disruptions, and the compensatory or defensive preoccupations of relatedness or self-definition further characterize the two primary configurations of anaclitic and introjective psychopathology respectively (Blatt, 2008). Within this framework, progression and regression are possible on each of the developmental lines of interpersonal relatedness and self-definition and in part, it also explains the high comorbidity and longitudinal relationships within the anaclitic and the introjective forms of psychopathology across Axis I and Axis II (Blatt & Luyten, 2010). Furthermore, the continuous approach between normal and disrupted personality development also yields paramount clinical implications for understanding structures and modes of psychopathology, mechanisms involved in therapeutic changes and potential effective clinical interventions (Luyten & Blatt, 2011).

## **1.4 Contributing Factors to Interpersonal Relatedness and Self-Definition in Personality Development**

### **1.4.1 Family Environment and Parental Influences**

Family environment, the quality of parenting in particular, has long been recognized as the central factor in socialization that determines a child's personality development. Since the socialization approach was challenged by Bell (1968), contemporary theories and findings of parental influences on child's normal and maladaptive personality development have indicated more sophisticated mechanisms involved in the parent-child interactions than early theories and studies (e.g. Caspi & Shiner, 2006; Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Reiss & Neiderhiser, 2000). In the two polarities model, the family environment is still considered one of the most significant contributors to the development of self-definition and interpersonal relatedness. From the theoretical perspective, the two polarities model of personality development is congruent with psychoanalytic object relations theory, attachment theory and cognitive development theory addressing the significance of early mother-infant experiences in the development of mental representation of self and other (Behrends & Blatt, 1985; Blatt, 1974; Blatt & Blass, 1990; Blatt & Lerner, 1983a; Blatt et al., 1975). The caregiving experiences embedded in the earliest relationship dyad between mother and infant form the fundamental template for organizing and guiding an individual's subsequent experiences of self and interpersonal relationships across the lifespan. Based on such strong theoretical arguments especially from the domains of object relation theories and attachment theory, the early environment of maternal care is considered a primary source that determines the infant's subsequent development.

Following the theoretical assumptions, empirical research regarding the two polarities model continues to emphasize the primary role of parental influences in personality development (see Chapter 3, Section 3.4.3). A series of studies (e.g. Ahmad & Soenens, 2010; Soenens et al., 2005; Soenens, Vansteenkiste, & Luyten, 2010) have differentiated two personality traits of parents based on the two polarities model and their subsequent impact on parenting styles in relations to children's personality features and depressive vulnerabilities. The studies have shown that the differentiation between these two domains of psychological control in parenting behaviours, in part, reveals the psychological processes in disrupted parental influences, the intergenerational

transmission of anaclitic and introjective issues and the intergenerational transmission of certain symptomology in their children (e.g. Ahmad & Soenens, 2010; Besser & Priel, 2005; Frost, Lahart, & Rosenblate, 1991; Soenens et al., 2010). For instance, the study conducted by Soenens and colleagues (2010) found that the parenting style of dependency-oriented psychological control (anaclitic personality feature related) and achievement-oriented control (introjective feature related) were found to correlate to anaclitic and introjective vulnerabilities in adolescents respectively, and further related to increased vulnerability for differentiated anaclitic and introjective depressive symptoms in these adolescents.

In attachment studies, family factors such as maternal sensitivity and responsiveness are key antecedents of infant's attachment security (review see Belsky, 1999) in early experiences. However, based on further evidence from meta-analysis (De Wolff & van Ijzendoorn, 1997), the effect size of the association between maternal sensitivity and infant's attachment security was only modest. The recent emphasis on quality of parenting has shifted from the quality of early mother-infant interactions to parental mental capacity to think of their own mental states as well as their relation with the child in early infancy or even later childhood. In attachment studies, the growing evidence found on Internal Working Models of parents provides further insight into some casual mechanisms involved in children's psychological development (Blatt & Homann, 1992; Fonagy, Steele, & Steele, 1991; Fonagy, Steele, Moran, Steele, & Higgitt, 1993; Slade, Belsky, Aber, & Phelps, 1999; van Ijzendoorn, 1995). These studies have found a significant link between the ability of parents to understand and potentially predict the mental states in self and other and infant's development of self-organization including pathological self-development during the early attachment process (see Chapter 2, Section 2.2.2). Furthermore, as illustrated by Beebe and colleagues' study (2007), maternal preoccupations with issues of self-definition or relatedness at 6 weeks postpartum could significantly predict infant's capacity for self-regulation and interactive regulation at 4 month old as well as later development of attachment patterns.

The strong emphasis on early environmental influences of caregiving experience has contributed significantly to our understandings of individual differences in normal and disrupted personality development. However, it is important not to lose the perspective

that attachment security is only one of many factors that predict children's personality development and well-being. As demonstrated in a series of attachment studies (see Chapter 2), the predictive power of attachment security on child adaptation or maladaptation is rather limited and appears more significant in combination with other risk factors in empirical studies (e.g. Belsky & Fearon, 2002; Fearon, Bakermans-Kranenburg, Van IJzendoorn, Lapsley, & Roisman, 2010; Groh, Roisman, van IJzendoorn, Bakermans-Kranenburg, & Fearon, 2012; Kobak, Cassidy, Lyons-Ruth, & Zir, 2006; Madigan, Atkinson, Laurin, & Benoit, 2013; Shaw, Owens, Vondra, Keenan, & Winslow, 1996). In contrast, some psychosocial factors surrounding the ecology of family appear to have relatively more significant effects on children's personality functioning even taking into account attachment security, such as maternal psychosocial distress (e.g. Dubois-Comtois, Moss, Cyr, & Pascuzzo, 2013). As attachment studies have shown, directly or indirectly, early experiences have discernible effects on personality development. As will be further elaborated on in Chapter 2, Section 2.2.3, it is important to appreciate the complexity of various development pathways from early attachment experiences within a broader psychosocial context. It should be noted that overly emphasizing early mother-infant attachment experiences might overlook other important factors involved in personality development as well as the current context. As the child grows, mental representation of self and other becomes increasingly complex, therefore, it could not be assumed that the effects of familial or parental influences on the child or the modes of relating will stay the same. For instance, attachment studies have indicated that adolescent's state of mind regarding attachment is significantly different from the system in early childhood. The effect of maternal mental state (i.e. maternal attachment security) on adolescents' state of mind was rather weak by middle to late adolescence (Allen, McElhaney, Kuperminc, & Jodl, 2004) as compared to stronger attachment concordance in infancy (see meta-analysis van IJzendoorn, 1995), and such relationships in adolescence appeared to be mediated through current qualities of parent-adolescent interactions (Allen et al., 2003). Furthermore, dynamic interactionistic approach in personality theories and social psychology has emphasised the interactions between individual's personality characteristics (including personality traits linked to fixed genes and temperament) and environmental factors (including perceived environmental factors) in understanding the person and behaviours (see Reynolds et al., 2010). Following this approach, the child's personality is viewed to have a reciprocal effect on the quality of the parent-child relationship (Caspi & Shiner,

2006; Magnusson, 1990) and some even argued that parents have minimal impact on adolescent development (Harris, 1995).

#### **1.4.2 Genetic and Neurobiological Influences**

Previous behavioural-genetic studies, especially in the attachment field, have consistently found supporting evidence for the primary role of early environmental influences on individual differences in attachment security for infants and children in early childhood, leaving the genetic effect as approximately none (Bokhorst, Bakermans-Kranenburg, Fonagy, & Schuengel, 2003; Fearon et al., 2006; O'Connor & Croft, 2001; Roisman & Fraley, 2008). These findings are consistent with the meta-analysis results that parental antecedent of infant attachment security is a combined effect of shared and non-shared environmental influences (Bakermans-Kranenburg, Van IJzendoorn, & Juffer, 2003; De Wolff & van IJzendoorn, 1997; van IJzendoorn, 1995). In contrast, studies in adolescence and adulthood have indicated varying degrees of genetic evidence. In the most recent behavioural-genetic study of adolescent attachment in a large-size cohort (Fearon, Shmueli-Goetz, Viding, Fonagy, & Plomin, 2013), it was found that variance in attachment was attributed to approximately 40% heritability and 60% non-shared environmental influences with minimal effect of the shared environment (see also Chapter 8).

Attachment studies of self-reported romantic love in young adulthood have reported relatively similar heritability results on the dimension of attachment anxiety (Brussoni, Jang, Livesley, & Macbeth, 2000; Crawford et al., 2007; Picardi, Fagnani, Nisticò, & Stazi, 2011). Self-report measures such as the Attachment Style Questionnaire (Hazan & Shaver, 1987) and the Relationship Questionnaire (Bartholomew & Horowitz, 1991) are frequently used for measuring attachment styles of attachment anxiety and attachment avoidance in romantic love on the premise that romantic love can be conceptualized as an attachment process influenced by early attachment experiences (Hazan & Shaver, 1987). These self-report measures of attachment styles in comparison to predominant attachment assessment measures by developmental researchers (such as Strange Situation Procedure, Child Attachment Interview and Adult Attachment Interview) are reviewed in next chapter, Section 2.2.2. In Brussoni and colleagues's

behavioural-genetic study of 239 adult twin pairs (2000), they estimated approximately 37% genetic influences on attachment security measured on attachment anxiety dimension and 60% variance due to non-shared environmental influences. However, on the dimension of attachment avoidance, the results showed no genetic influences and 29% shared environmental influences on attachment security. Similarly in Crawford and colleagues' twin study (2007), 40% variance was reported due to genes on attachment anxiety but none on attachment avoidance. In a larger sample of 677 twin pairs, Picardi and colleagues (2011) found 45% genetic influences and 55% non-shared environmental influences on attachment anxiety dimension however 36% heritability and 64% non-shared environmental influences on attachment avoidance.

Previous behavioural-genetic studies on attachment security from infancy to adulthood have reported different genetic and environmental influences on attachment security. It is tempting to assume, on the basis of the discrepant genetic evidence found in attachment security from infancy to young adulthood, that the underlying mental representations of attachment relationships may have different mechanisms involved as they evolve in the development process. However, it should be noted that these estimated heritability findings should not be generalized or interpreted equivocally about the pattern of heritability of attachment across different age groups, especially considering the different attachment measures used. The self-report attachment measures not only raise concerns about the validity of tapping into unconscious attachment strategies in attachment research, but also the attachment relationships measured are romantic partners rather than primary attachment figures such as parents. Such attachment security in adulthood is only under the assumption that the current romantic attachment styles are influenced by early attachment experiences (Hazan & Shaver, 1987). Thus, the use of a self-report questionnaire measure of attachment styles in adult samples may yield significantly different results than representational or interview measures used in samples of infants and young children.

From a slightly different perspective, some behavioural-genetic studies investigating the nature of the relationship between child personality and family environment have suggested that the association between the two is mediated by genetic factors. It was indicated in a number of studies that measures of family environment including parenting are modestly heritable (e.g. Bouchard & McGue, 1990; Elkins, McGue, & Iacono, 1997; McGue, Elkins, Walden, & Iacono, 2005; Rowe, 1981). For instance,

Elkins and colleagues (1997) used self-report parent-child relationships in a sample of 826 male twins and their parents to investigate genetic and environmental influences on family relationships. It was found that there were significant genetic influences on individuals' perceptions of parent-son conflict, regard, involvement and overall support. In particular, cross-sectional comparisons between twins at ages 11 and 17 reported significantly higher heritability in older twins. It is proposed by Bouchard and Loehlin (2001) that an individual's genetically influenced characteristics could affect the environmental measures as the genetic manifestations found on environment measures may reflect these personality characteristics. To be more specific, Scarr and McCartney (1983) explained two mechanisms involved in such a genetic link termed evocative and active gene-environment correlations. Evocative correlation occurs when an individual's genetically influenced personality characteristics evoke specific responses from others, and active correlation occurs when genetically influenced personality characteristics affect the process by which individuals actively select their environments, or the process by which they perceive aspects of their interpersonal relationships. Furthermore, in the Minnesota Study of Twins Reared Apart (MISTRA) project, there is evidence suggesting that the same genotype leading to adult personality influences an individual's recall of childhood rearing environment (Krueger, Markon, & Bouchard, 2003). These findings on personality traits as well as potential heritability findings in self-reported adult romantic attachment and adolescent attachment, may imply that the correlations between genes and current qualities of parent-child relationships, or between genes and underlying mental representation of self and other become increasingly influential as personality becomes more stabilized and mature during adolescence.

At a genetic molecular level, some researchers attempted to identify candidate genes that might be linked to attachment infancy (Barry, Kochanska, & Philibert, 2008; Chen, Barth, Johnson, Gotlib, & Johnson, 2011; Spangler, Johann, Ronai, & Zimmermann, 2009). These studies have reported the involvement of polymorphisms in the dopamine D4 receptor gene, the serotonin transporter gene and the oxytocin receptor gene in potential associations or gene-by-environment interactions in relation to attachment security. For instance, Chen and colleagues (2011) investigated whether variance in infant's attachment security might be related to variation in the oxytocin receptor gene in a sample 176 infants. The attachment classifications of the infants were based on the

Strange Situation Procedure. It was found that the A allele of *OXTR* rs2254298 was significantly associated with attachment security in the non-Caucasian infants ( $p < 0.005$ ), which suggested the importance of oxytocin in the development of human social behaviour and its role in social stress-regulation and the development of trust. However, some of the findings in these candidate gene studies were not replicated in a later study with a larger sample conducted by Luijk and colleagues (2011). Luijk and colleagues tested main and interaction effects of candidate genes involved in dopamine, serotonin and oxytocin systems on attachment security and disorganization in two birth cohort studies with a sample of more than 1,000 infants and their parents. In their study, infants' attachment classifications were assessed with the Strange Situation Procedure and the parental sensitivity was assessed with an observational rating scale developed by Ainsworth, Bell and Stayton (1991). The results were reported to have no consistent additive genetic association for attachment security and attachment disorganization.

Although it cannot be extensively reviewed in this thesis, in comparison to inconsistent evidence found in molecular genetic studies, there are emerging studies of neurobiological evidence on personality dimensions of self-definition and interpersonal relatedness. Distinct neural circuits in attachment and caregiving behaviours were documented in animal and human research (review see Insel & Young, 2001). These neural circuits primarily involve a mesocorticolimbic dopaminergic reward circuit and hypothalamic-midbrain-limbic-paralimbic-cortical circuits (Fonagy, Luyten, & Strathearn, 2011; Swain, Lorberbaum, Kose, & Strathearn, 2007). For instance, Swain and colleagues (2007) reviewed evidence of brain circuitry underlying parenting from relevant rodent and nonhuman primate research as well as human research. They further examined neurobiology of parenting behaviour of human subjects in functional neuroimaging studies and suggested that networks of highly conserved hypothalamic-midbrain-limbic-paralimbic-cortical circuits act in relation to supporting aspects of parent response to infants. In particular, infant stimuli activate basal forebrain regions that regulate brain circuits concerned with specific nurturing and caregiving responses and activate more general circuitry that is responsible for effective parenting including regulating emotions, motivation, attention and empathy (Swain et al., 2007).

In the dimension of self-definition, social and cognitive neuroscience has also documented evidence of the neural circuits involved in the development of the self and



self-representations (see meta-analysis Northoff et al., 2006). These mainly involve cortical midline structures such as the medial prefrontal cortex, posterior cingulate, precuneus, and temporal parietal junction (Lieberman, 2007; Lombardo, Chakrabarti, Bullmore, Baron-Cohen, & Consortium, 2011; Lombardo et al., 2010), which have been shown to underlie social cognition regarding others, theory of mind and mentalization (D'Argembeau et al., 2011; Fonagy et al., 2011; Lombardo et al., 2010). For instance, Lombardo and colleagues (2010) used a sample of 29 adult males to examine social-communication difficulties in autism and pinpointed the right temporo-parietal junction as one of the neural systems responsible for deficits in representing mental states. Participants were scanned with fMRI comparing regions of interest within mentalizing circuitry while making reflective mentalizing or physical judgments about the self or other. The results of mentalizing circuitry were compared for between group differences in activation of regions as well as correlation with social symptom severity. It was reported that the right temporo-parietal junction was the only mentalizing region that responded atypically in autism and was selectively more responsive to mentalizing than physical judgment of self and other. Furthermore, the selective responses were related to the degree of reciprocal social impairment in autism (Lombardo et al., 2010).

At a neurobiological level, based on research on human subjects, the neuropeptides oxytocin and vasopressin were reported to have significant influences on affiliative behaviours including parental care, pair bonding and sexual behaviour, and furthermore oxytocin also fosters positive feelings about the self, effective stress regulation and explorative behaviours (Insel & Young, 2001; Neumann, 2008). As oxytocin was reported to have a significant effect on the relatedness dimension of affiliative behaviours and the self-definition of effective stress regulation and explorative behaviour, it potentially may suggest a link between experiences of relatedness to opportunities for developing feelings of autonomy, competency and identity that further enhance coping and affect regulation (Fonagy & Luyten, 2009). In a way, although the research findings in the neurobiological field cannot be generalized, they provide potentially valuable evidence for the two polarities model of self-definition and interpersonal relatedness (Luyten & Blatt, 2013). In particular the overlap between neural circuits involved in social cognition in relation to the self and others supports the synergistic interaction between relatedness and self-definition of the two polarities model (D'Argembeau et al., 2011; Fonagy et al., 2011; Lombardo et al., 2010), as well

as the consequences of disruptions in the dialectic interaction between self-definition and relatedness on underlying neural circuits (Simeon et al., 2011).

### **1.4.3 Sociocultural Environmental Influences**

In a broader sociocultural environmental context, at least in western cultures, it is commonly assumed that men tend to emphasize on issues of self-definition whereas women tend to invest more in issues of interpersonal relatedness, congruent with the social expectations within the cultures (Beck, 1983; Blatt, 2008). A number of research studies have found evidence to support the assumption of a two polarities model, that gender differences are related to the polar expressions of psychopathology. In other words, men are found to be more likely to have externalizing disorders and internalizing disorders that involve preoccupation with self-definition (Beauchaine, Klein, Crowell, Derbidge, & Gatzke-Kopp, 2009; Parker et al., 1999), whereas women are more likely to have internalizing disorders involving issues of relatedness (Besser, Vliegen, Luyten, & Blatt, 2008; Leadbeater, Blatt, & Quinlan, 1995; Soenens et al., 2005). For instance, in Silverstein's (e.g. 1999) epistemological study re-analyzing data from the Epidemiological Catchment Area study, he found that the prevalence of depression associated with somatic symptoms was higher among women than men, consistent with the findings of the National Comorbidity Survey. In Besser and colleagues' (2008) systematic empirical investigation of postpartum depression using Blatt's two polarities model, research evidence indicated the link between anaclitic traits and prevalence of internalizing disorders in females such as somatic depression, functional somatic and personality disorders involving preoccupation with issues of relatedness. In contrast, men were found to be more likely to have hostile or irritable depression (Parker et al., 1999) and antisocial personality disorder (Beauchaine et al., 2009) involving preoccupation with issues of self-definition.

However, a meta-analysis of gender differences in polarities forms of depression and some other studies have indicated no significant differences between men and women concerning issues of self-definition at least in western cultures (Leadbeater et al., 1995; Luyten et al., 2005; Nietzel & Harris, 1990). This may reflect a rapidly changing role of gender in western societies or such a phenomenon is congruent with the overall

individualistic or independent cultures in western societies emphasizing the role of self-definition as opposed to the collective or interdependent cultures (Kitayama, Markus, Matsumoto, & Norasakkunkit, 1997; Markus & Kitayama, 1991; Triandis, 2001).

Indeed, some studies have indicated that prevalence of certain psychopathology may depend on the differences of wider cultural emphasis on self-definition and relatedness (Soenens, Park, Vansteenkiste, & Mouratidis, 2012). Incongruence with the cultural emphasis is therefore more likely to be perceived as more severe maladaptation. For instance, studies of Asian Americans have found them to have higher levels of self-critical perfectionism than Caucasian Americans (DiBartolo & Rendón, 2012), considering that self-definition and personal achievement are more consistent with the predominate values of the individualistic Caucasian culture.

Besides gender, cultural factors such as collectivism and individualism may influence personality development especially considering different cultures differ in emphasis on relatedness and self-definition within their cultural values. Theoretically speaking, collectivistic culture is often considered to emphasize the dimension of relatedness whereas individualistic cultures tend to emphasize the value of self-definition (Kagitcibasi, 2005; Markus & Kitayama, 1991; Triandis, 2001). Individuals in many Asian cultures emphasizing collectiveness or interdependence may also emphasize the relatedness issues such as attending to others, fitting in and harmonious interdependence with others. In comparison, individuals in individualist or independent culture may be concerned about issues of maintaining independence from others by attending to self and expressing their unique inner attributes. Such cultural differences in conceptions of self, of others and the interdependence of self and other may have a distinct impact on the nature of individual experiences including cognition, emotion and motivation (Markus & Kitayama, 1991). For instance, DiBartolo and Rendón (2012) have reviewed published studies on the construct of perfectionism and its relationship to mental health from a cross-cultural perspective in the US. They found that ethnic minority Asian Americans were consistently reported to have higher levels of maladaptive perfectionism on self-report questionnaires than the culturally predominant ethnic group of Caucasian Americans. As high levels of maladaptive perfectionism is an expression of intense preoccupation with self-definition, this result is important in the sociocultural context in which the differences between ethnic groups might suggest complex interactions among sociocultural factors, which may influence parenting styles and subsequent personality development (Ahmad & Soenens, 2010; Chang & Asakawa,

2003). Moreover, according to Cohen and Hill (2007), religious factors may also play an important role in understanding personality development of self-definition and interpersonal relatedness as different religions vary in individualistic and collective aspects of religiousness and spirituality. The influences of religious factors may to an extent reinforce or weaken cultural patterns of individualism or collectivism.

It is difficult to specify sociocultural factors that could influence personality development as the wider social and cultural context often interacts with subculture values (Ahmad & Soenens, 2010; Cohen & Hill, 2007) as well as the micro-level family context or even specific parenting styles (Ahmad & Soenens, 2010; Kitayama et al., 1997) in very complex ways which affect children's personality development. Regardless of the complex nature of sociocultural factors involved in the development of self-definition and interpersonal relatedness, it is still important to have more cross-cultural studies across and within different cultures to better understand how various cultural factors could contribute to adaptive and maladaptive personality development at different levels.

### **1.5 Limitations of Blatt's Two Polarities Model**

The previous sections have reviewed the significance of Blatt's two polarities model of self-definition and interpersonal relatedness in understanding normal and disrupted personality development. Within the systematic framework of the two polarities model, this thesis focuses on the development of mental representations of self and other. Blatt's theoretical model proposes a psychodynamic and developmental sequence in which mental representation of self and other initially emerges from the early mother-infant relationship. As the mental representation develops and unfolds during the developmental process, it evolves from global, diffuse, fragmentary and inflexible earlier modes of representation to increasingly differentiated, accurate, empathetic and complex organized mental representational structures of self and other (Behrends & Blatt, 1985; Blatt, 1974; Blatt & Blass, 1990; Blatt & Lerner, 1983a; Blatt et al., 1975). Different levels of mental representation of self and other of Blatt's model are outlined in Chapter 4. These hierarchical developmental levels not only represent normal developmental sequences from infancy to adulthood to a great extent, but also characterize different levels of personality functioning consonant with varying

expressions of psychopathology. As the representations serve as internal templates in personality structure, the levels of mental representation of self and other determine and characterize how individuals experience self and others.

In both normative and disrupted personality development, the central dynamic force underlying the development of mental representation of self and other is the constant striving to maintain the balance between the fundamental dimensions of self-definition and interpersonal relatedness. In a normal range, varying degrees of emphasis on either self-definition or interpersonal relatedness express different characteristics of personality organization. However, deviations from the normative range as a result of severe disruptions of the two developmental lines are expressed in the forms of psychopathology. Based on the points addressed above, some limitations of Blatt's theoretical model of mental representation of self and other as well as the derived assessment measure are discussed here.

First of all, from a developmental perspective, although Blatt's model is formulated on the basis of attachment theory, cognitive psychology and object relations theory and has incorporated an integrated developmental perspective of personality development, it focuses mainly on developmental psychopathology. As outlined in Section 1.3, different forms of psychopathology can be viewed congruent with failures to acquire the capacity at early developmental stage. This includes the equivalence between disruptions in boundary constancy and symptomatology of schizophrenia (Blatt & Wild, 1976; Blatt et al., 1975), between failure to acquire object constancy and symptomology of borderline patients (Blatt & Auerbach, 1988; Blatt & Shichman, 1983), and the correspondence between deviations after object-constancy and various neurotic symptomology of anaclitic and introjective psychopathology (Blatt & Shichman, 1983; Blatt, 2008). Therefore, even though Blatt's model of mental representation is conceptually related to normal developmental stages, the application of the model lies in understanding disruptions and deviations from the normative model and the development of psychopathology. Unlike attachment theory, the model does not provide the normative range for understating individual differences at different developmental ages. In the development process of operationalizing assessment measure of the levels of mental representation of self and other, Blatt and colleagues (1976) initially investigated individuals' developmental differences using Rorschach projective test in response to descriptions of human figures in a longitudinal study of a normative sample with an age

range from 11 to 30 years old. It was found that the descriptions of human figures become more accurate, articulated and richer with more integrated, reciprocal and benevolent interactions increasing with age. The developmental differences are acknowledged in terms of capacities for articulation, differentiation, integration and affective components and have extended the normative range of levels of mental representation. However, it does not provide an insight for distinguishing maladaptation or delayed developmental level of mental representation when it is considered normative at a particular developmental stage.

Secondly, in Blatt's model, levels of mental representation of self and other range from the least adaptive to the most adaptive representation in relation to personality functioning. The model provides both a more primitive pathological end of the clinical spectrum and an ultimate end of highly adaptive functioning. At each developmental level, individual strives to maintain the balance between self-definition and interpersonal relatedness and works towards higher levels of mental representation. Although the normative or healthy range of mental representation have several hierarchical levels, the highest end of levels of mental representation are equally rare as the clinical range in a normative population. In contrast, the lower ends of the model are extensively elaborated with distinctive features, which have a wider application in clinical populations. This might be due to the mental representation model has a heavy emphasis on object relations theory which emerged from a clinical tradition and focused more on psychopathology. Although the mental representation model encompasses higher levels of personality functioning, the model is not derived from observational studies and research in normative populations as the attachment theory and cognitive psychology approach. The development and operationalization of the assessment measures of mental representation of self and other are based on extensive previous research on Rorschach and other projective techniques in clinical populations (Blatt & Lerner, 1983b). One of the earliest methodologies to assess the structural dimensions of self and object representations through levels of differentiation and relatedness is based on responses to Rorschach (Blatt, 1978). It is used to discriminate among various diagnostic groups (e.g. Blatt et al., 1984; Blatt & Lerner, 1983b; Spear & Sugarman, 1984) and evaluate patients' clinical progress over the course of treatment (e.g. Blatt & Ford, 1994; Blatt, Ford, et al., 1988a; Blatt, Ford, Berman, Cook, & Meyer, 1988b; Blatt & Shahar, 2004). In contrast to extensive use of the assessment measures of

mental representation in clinical research (see Chapter 4), no substantial evidence has gathered to support the normative or higher ends of mental representation levels, apart from identifying a threshold level for differentiating psychiatric patients from normal controls (Luyten, Meganck, Jansen, De Grave, & Corveleyn, 2006), and between secure and insecure attachment (Levy et al., 1998).

Finally, Blatt's model of mental representation of self and other builds on the foundation that the early form of mental representation emerges from early mother-infant caring experiences. This theoretical assumption is consistent with the attachment theory and object relations theory with the primary emphasis on quality of mother-infant relationship in the early environment. The representational models formed in early experiences gradually become relatively enduring internal structures that determine the developmental level and quality of interpersonal relationships to which an individual is predisposed (Blatt & Lerner, 1983a). As reviewed in the previous section, the emphasis of environmental influences in development of mental representation of self and other may overlook other important mechanisms involved in personality development, such as genes. Considering the research findings on intergenerational transmissions of anaclitic and introjective traits in personality and psychopathology (Chapter 3 Section 3.4.3), and some findings of genetic influences on similar mental representational construct such as attachment (Section 1.4) in adolescence and adulthood, it is therefore important to consider the involvement of genetic mechanism in the model of mental representation, especially mental representation of self and other becomes increasingly complex as the child develops.

In sum, based on the significant contributions of the two polarities model in understanding normal and disrupted personality development and the limitations of Blatt's mental representation model, the next Chapter will review attachment theory and research in relation to the polarities model. As attachment theory stems from developmental theory and observational research describing the natural emergence of parent-infant bonding processes, subsequent development of attachment theory and research follows strong emphasis on normal development. The integrations between Blatt's two polarities model and attachment theory as well as the conjoining between assessment measures from the two domains may yield a fuller understanding of personality development.

## **Chapter 2 Interpersonal Relatedness and Self-Definition in Attachment Theory**

### **2.1 Introduction**

A significant body of current research on interpersonal relatedness as well as self-development in personality development has directly or indirectly been influenced by studies of the dynamics of attachment and separation in early caregiving experiences. Attachment theory was first conceptualized by John Bowlby (1969, 1973, 1980) and later enriched by the work of Mary Ainsworth (1970; 1969), Mary Main (1985), Inge Bretherton (1985, 1987, 1991) and many others (e.g. Crittenden, 1990; Mikulincer & Shaver, 2007; Sroufe, 1990; also see Cassidy & Shaver, 2008). The central tenet of attachment theory is that differences in attachment security of mother-infant relationships have significant long-term influences on individual's subsequent intimate relationships throughout their lifespan, the development of self and the emergence of psychological disturbances (e.g. Dozier, Stovall-McClough, & Albus, 2008; Green & Goldwyn, 2002; Weinfield, Whaley, & Egeland, 2004). Nowadays, attachment theory not only occupies a unique position in both psychoanalytical thinking and developmental psychology, but also demonstrates significant implications for clinical practice.

Despite some significant divergence between attachment theory and psychoanalysis, these two theoretical approaches share some common ground. Within psychoanalysis, the school of contemporary psychoanalysis, in particular with the shift from classical drive theory to an increasing focus on object-relations theory (e.g. Blatt, 1974; Blatt & Lerner, 1983a; Mahler et al., 1975; Winnicott, 1960), is to a great extent congruent with theoretical and empirical attachment work on symbolic representation of attachment relationships (e.g. Main, Goldwyn, & Hesse, 1998; Main et al., 1985). Both theoretical approaches view psychological development as emerging within an interpersonal matrix where an infant's early relationship with the primary caregiver plays a vital role throughout their lifespan. As described by Peter Fonagy (2001), attachment theory and psychoanalytic theory have common roots but have evolved in epistemologically distinct ways. Although the security of attachment in a relationship is generally considered to have a significant influence on children's cognitive, emotional and social



development from childhood to adulthood (Kobak et al., 2006), as will be discussed later in this chapter, attachment studies are still limited to providing strong and consistent evidence for specifications of causal determinants of parent-infant attachment security, how attachment continuities from early infancy to later adulthood, or insight into the way in which the attachment system interacts with personality development as well as psychological disturbances. Therefore, integrative attempts to bring the commonly rooted psychoanalysis and attachment theory closer together have become increasingly essential and advantageous in establishing a more heuristic theoretical context for understanding the potential causes and developmental course of individual differences in personality functioning and psychopathology. So far, a number of endeavours to integrate psychoanalysis and attachment theory have, with tremendous significance, enriched both traditions (e.g. Bretherton, 1987; Eagle, 1997; Fonagy, 2001; Marrone, 1998; Stern, 1985). Blatt's two polarities model of personality development is a remarkable attempt to bridge the gap between the two theoretical approaches (Blatt & Levy, 2003). The two polarities model of self-definition and interpersonal relatedness in normal and disrupted personality development deriving from a wide variety of disciplines, ranging from philosophy, evolutionary and cross-cultural psychology to personality, social psychology and psychoanalysis (Blatt, 2008), constitutes a complementary perspective on the understanding of attachment in a broader context.

## **2.2 A Brief Overview of Attachment Theory and Some Main Findings**

It would be impossible to compress the extensive attachment literature and numerous attachment research findings into one single section. Thus, some key ideas of attachment theory and studies that are relevant to this thesis are summarized here. From a dimensional perspective, attachment theory primarily includes an interpersonal behavioural dimension grounded in a biologically inherent "motivational-behavioural control system" (Bowlby, 1969; Bretherton, 1985; Waters & Deane, 1982) and a dimension of representational structure of internal working models of attachment figures and of the self (Ainsworth, 1982; Bowlby, 1973, 1980; Bretherton, 1991; Main et al., 1985).

Bowlby (1958) strongly maintained that a human infant is born with a biological proclivity to form affectional bonds with caregivers for the evolutionary purpose of survival. Around the second half year of the infant's life, the infant's biological propensity to optimize proximity to caregivers along with initiating, maintaining or retaining interactional behaviours is integrated into a more coherent system directed towards a principal caregiver, discriminated from other people (Bowlby, 1969, 1973). The attachment in a narrower sense is thus applied to a small hierarchy of primary caregivers with a preferential attachment relationship (Bretherton, 1980). In the behavioural dimension, attachment theory focuses on an innate behavioural system that regulates an infant's behaviours to maintain and obtain proximity to the primary attachment figure for felt security (Sroufe & Waters, 1977) in early childhood and even in later development in stressful situations. In other words, the attachment theory proposes a distinct internal motivation system in personality development different from psychoanalytic object relations theory with a set-goal of enhancing proximity to the primary caregiver in a range of contexts. The main biological function of attachment behaviour is to ensure a state of homeostasis between the child and the environment as well as an inner physiological equilibrium based on the psychological bond to the attachment figure (Bowlby, 1973).

In the initial development of attachment theory, Bowlby (1969) emphasized physical proximity as the set-goal of the attachment behavioural system. Attachment behaviours can be activated in times of perceived danger or threat from the environment or perceived separation from the attachment figure and deactivated by perceived safety in the environment. However, as elaborated on later by Ainsworth (1969) and Bretherton (1980), the attachment system can be understood from a wider perspective in which it is continuously active beyond the times of perceived danger from the environment. When there is no perceived danger in the environment, the child can use the attachment figure as a secure base to explore freely at some distance, whereas the experience of fear and stress triggered by perceived danger can pull the child back to the attachment figure to seek security. Therefore, in coordination with the exploratory behavioural system and the fear system (Bischof, 1975; Bowlby, 1973), the overall attachment system is considered to be in continuous operation.

It is frequently stressed in the literature that the physical or psychological perception of the unavailability of the attachment figure is also perceived as a potential threat by the

child and the expected non-responsiveness of the attachment figure may yield an even more permanent effect as perceived danger (Bretherton, 1985). As attachment theory evolves, the set-goal of the attachment system is addressed so as to maintain the caregiver's accessibility and responsiveness (Bowlby, 1973) with a critical function of appraisal or evaluation of the anticipated availability of the attachment figure in the operation of the attachment system (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1980). Following this approach, a substantial amount of attachment research has shifted its focus from interactive behavioural patterns to representational models of attachment figures and the self, that underpin the individual differences in the functioning of attachment behavioural systems (e.g. Bretherton & Munholland, 2008; Crittenden, 1990; Main & Cassidy, 1988; Main & Goldwyn, 1984; Main & Hesse, 1990; Main et al., 1985).

The representational dimension of attachment is concerned with the ways in which early attachment relationships are subjectively experienced and internally constructed by the child as a set of working models that further organize and guide affective experiences of the self and his or her expectations of intimate relationships with others in later life. In light of the work of Mary Main and her colleagues (Main & Cassidy, 1988; Main & Goldwyn, 1984; Main et al., 1985), Bowlby (1988/2005) noted that the representational structure of attachment is postulated to include *“the working models a child builds of his mother and her ways of communicating and behaving towards him, and a comparable model of his father, together with the complementary models of himself in interactions with each”* (p.146). The representational structure or Internal Working Model (IWM; Craik, 1943) therefore includes a conception of the expected availability of the attachment figure as well as a sense of self, embedded in the earliest intimate relationship (Bretherton, 1987; Levy et al., 1998; Zeanah & Anders, 1987). As implied by Bowlby (1988/2005), in this process of internalization of early attachment experiences, the representation of self is closely intertwined with the representation of the attachment figure in the dyadic attachment relationship at an early stage. For instance, the child's working model of a rejecting attachment figure may closely accompany the emerged sense of self as unlovable and unworthy in the working model of the self. Furthermore in attachment theory, even when the working model of the self has become increasingly distinct as the child develops, the sense of self is still regarded as closely associated with the working model of the attachment figure. Both the

working model of the attached self and the working model of the attachment figure represent obverse aspects of the same attachment relationship and thus could not be understood without reference to each other (Bretherton, 1985; Sroufe & Fleeson, 1986). Attachment theory emphasizes the centrality of interpersonal relatedness in personality development. The development of a sense of self intertwined with a representation of the attachment figure is viewed as a secondary by-product in the development process of increasingly mature and positive attachment relationships (fuller reviews see Blatt & Blass, 1990; Blatt & Blass, 1996). The concept of self is grounded in the internal working models of attachment relationships that together will be incorporated into the personality structure through the developmental process (Main et al., 1985; Sroufe & Fleeson, 1986). Such an interactive developmental approach in which the self system and the representations of others develop interdependently in the self-other relationship (e.g. Baldwin, 1911; Cooley, 1902; Emde, 1988; Epstein, 1980; Mead, 2009) is to a great extent congruent with Blatt's two polarities model of the dialectic transactions between self-definition and interpersonal relatedness in personality development (Blatt & Levy, 2003).

As described earlier, the internal working models of attachment relationships that are constructed during the first 18 months (approximately) of an infant's life consist of the child's expectations about self, significant others and interpersonal relationships on the basis of the previously internalized content about the self and attachment figures as well as affects associated with those experiences (Bowlby, 1980; Bretherton, 1985, 1990; Collins & Read, 1994b). These working models operate on an unconscious level. They organize and guide an individual's attention and behaviour, influence their perceived information and the interpretation, as well as the retaining, of memory (Bowlby, 1980; Bretherton, 1985; Main et al., 1985). Theoretically speaking, as the working models are developing on the principle of assimilation, the representational structure is assumed to remain relatively stable over the time (Bowlby, 1973). Therefore, at least from the theoretical perspective of attachment, the working models of attachment relationships are considered to be relatively solid foundations of personality development.

As discussed in Chapter 1 Section 1.2, the mental representations of self and others originating from "the representational world" (Sandler & Rosenblatt, 1962), are a set of affective-cognitive schemas that develop from early interpersonal experiences and have

life-long lasting effect on individual's subsequent interpersonal relationships and the development of self, influencing one's expectations, feelings, and general patterns of behaviours in the social world (Diamond & Blatt, 1994; Slade & Aber, 1992). To a certain degree, the development and function of the internal working models is similar to the concept of mental representations of self and others in developmental psychoanalytic theory (Blatt, 1974; Fairbairn, 1952; Jacobson, 1964; Kernberg, 1976; Winnicott, 1960). However, it should be noted that despite some resemblances, the internal working models in attachment theory and the mental representations in object relations theory still differ in some respects. For instance, differing from internal working models of attachment, the representations of self and other in psychoanalytic theories include important aspects of individual's psychic life such as impulses, affects, drives and fantasies (Beres & Joseph, 1970b; Blatt, 1974; Blatt & Levy, 2003; Sandler & Rosenblatt, 1962).

In particular, the more recent conceptualization of object representation in contemporary psychoanalysis has extended the internalized relational aspects of self-other representations (Kernberg, 1976) as well as putting an emphasis on their structural developmental differences in the development process (Blatt, 1974; Diamond & Blatt, 1994; Erikson, 1959; Levy et al., 1998). The mental representations of self and other proceed through a developmental sequence and become increasingly complex, abstract, symbolic, and verbally mediated as they develop. In attachment theory, the internal working models are also recognized to be dynamic, as Bowlby and other attachment theorists have stressed, in both the relational aspects and working aspects of the representational structures (Bretherton, 1985). However, there is little developmental difference acknowledged in attachment studies other than very limited studies (e.g. Marvin & Greenberg, 1982) and different attachment measures are used for different age ranges (Blatt & Levy, 2003). Compared to the elaborate development processes outlined in the mental representations of self and other (see Chapter 1), the prototypic attachment patterns in attachment studies appear to be rather broad and static. The classifications of attachment patterns are defined predominately by the quality of attachment relationships including a model of the self as either positive or negative and models of significant others as positive or negative with rather limited developmental differences within such representational structures (see Section 2.3). Therefore, Blatt and his colleagues' attempts to integrate the IWMs of attachment with the more

sophisticated and dynamically structured concept of the representational world in psychoanalysis, propose to elaborate the IWMs in a more intricate, complex and developmental way. This approach of integration will be further elaborated upon in the following sections in terms of Blatt's two polarities model of attachment (see Sections 2.3 and 2.4).

### **2.2.1 Assessment Measures and Attachment Classifications**

#### ***Review of Attachment Measures***

With respect to the significance of attachment theory, the measured attachment results will provide not only an index of children's psychosocial functioning in the normal developmental process, but also a valuable insight into potential psychological disturbance that may be associated with different insecure attachment patterns. Research into the determinants of attachment security, individual differences in attachment behaviours and links to adaptive or maladaptive psychological functioning is critically dependent on reliable and valid attachment measures. Consistent with the two dimensions of attachment theory, various measures of attachment assessment can be viewed to cluster around two domains, namely assessment measures based on observation of a child's attachment behaviour and those measures based on one's internal representations.

The two currently predominant assessment measures in attachment research are the Strange Situation Procedure (SSP; Ainsworth et al., 1978) to examine infants' and toddlers' behavioural strategies for maintaining proximity to their attachment figures and the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985, 1996) to measure adult attachment through discourse analysis. The Strange Situation Procedure assesses a child's behaviour patterns in episodes of separation from, and reunion with, the attachment figure and is the most validated and reliable measure of attachment security in infancy and early childhood (review see Solomon & George, 2008). The AAI assesses adult attachment at a representational level by examining an adult's current state of mind regarding their childhood relationships with their parents. The AAI is a highly validated assessment tool, widely used to study how an adult's attachment might influence their parenting behaviour and the attachment patterns of their children (Bartholomew & Shaver, 1998). In a somewhat separate line of research into adult

attachment, self-report measures such as the Attachment Style Questionnaire (Hazan & Shaver, 1987) and the Relationship Questionnaire (Bartholomew & Horowitz, 1991) are frequently used for measuring attachment security in adult romantic love, which is based on the premise that romantic love can be conceptualized as an attachment process influenced by early attachment experiences (Hazan & Shaver, 1987). Despite some criticism of the validity of self-report questionnaire measures for accessing unconscious attachment strategies (see Crowell, Fraley, & Shaver, 2008), the attachment measures of adolescent and adult romantic love have addressed the influence of attachment patterns on individual's adjustment, behaviours and experiences in intimate relationships (review see Shaver & Clark, 1994). A more systematic review of various adult attachment measures can be found in the work of Crowell (2008). While assessment measures of attachment in infancy and adulthood are well established, the study of attachment measures in childhood and adolescence is relatively new. There are some established attachment measures with satisfying validity and reliability for older toddlers and children such as the Preschool Strange Situation (Cassidy, Marvin, & the MacArthur Working Group on Attachment, 1989), the Attachment Q-sort (Waters & Deane, 1985), the Separation Anxiety Test (Slough & Greenberg, 1990; Wright, Binney, & Smith, 1995), story stems including a number of attachment-focused doll-play procedures (Bretherton, Oppenheim, Buchsbaum, Emde, & the MacArthur Narrative Group, 1990; Green, Stanley, Smith, & Goldwyn, 2000; Hodges, Hillman, Steele, & Henderson, 2004) and the Child Attachment Interview (CAI; Target, Fonagy, & Shmueli-Goetz, 2003).

In adolescence, the attachment system is reconstructed and evolves drastically. Not only do adolescents begin to develop a more integrated and generalized stance towards attachment relationships from experiences with multiple caregivers (Hesse, 2008; Main et al., 1985), but also, this emerged overarching attachment organization is more mature and stable for predicting future behavioural and emotional functioning within and beyond the family context (Hesse, 2008). Therefore, considering the transformations of the attachment system and the increasing consolidation of self-identity during this developmental phase (see Chapter 3), it is important to view the attachment during adolescence as a growing individual, rather than merely relational, characteristic (Allen, 2008; Main et al., 1998). Accordingly, the tentative dynamics of adolescent development may require attachment measures to assess the attachment as an

organizational construct that reflects both the intrapsychic development and multiple aspects of on-going attachment relationships rather than either an intrapsychic or relationship construct alone (Sroufe & Waters, 1977; Thompson, 1997). In current attachment studies, the attachment of adolescents is measured at a representational level. However, despite some relatively well-established measures for adolescent attachment, there is still limited research focusing on the characteristics of individual adolescent attachment relationships (Allen, 2008). Measures are more developed in the form of questionnaire-based assessments, such as the Parental Bonding Instrument (Parker, 1990; Wilhelm, Niven, Parker, & Hadzi-Pavlovic, 2005), the Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987), the Parental Relationship Questionnaire (Kenny, 1987) and the Adolescent Attachment Questionnaire (West, Rose, Spreng, Sheldon-Keller, & Adam, 1998). The more elaborate forms of assessment in adolescence remain rather restricted including the Friends and Family Interview (Steele, 2005) for young adolescents, the Attachment Interview for Childhood and Adolescence (AICA; Ammaniti, Van Ijzendoorn, Speranza, & Tambelli, 2000) and the Hansburg Separation Anxiety Test (Hansburg, 1980). The most frequently used measures in attachment research for adolescents are questionnaire-based measures and the interview protocols of the Adult Attachment Interview (George et al., 1996) or the Attachment Interview for Childhood and Adolescence (AICA; Ammaniti et al., 2000). As the self-report form of questionnaire often raises some general criticism of the validity of measurement of the unconscious representations of attachment (see Crowell et al., 2008), the more elaborate form of attachment interview is considered more sufficient and promising in eliciting information about the attachment system during adolescence. However, despite the strengths of strong validity, reliability and convergent validity with commonly used attachment classifications, the interview process of the AAI or the AICA is still a costly and time-consuming procedure. Furthermore, as already demonstrated by using the adapted AAI interview version AICA in older children aged between 10-16 years (Ammaniti et al., 2000), there is a risk of under-representing disorganized attachment and over-representing dismissing attachment strategy due to developmental differences, especially for younger children (Shmueli-Goetz, Target, Fonagy, & Datta, 2008). Thus, for adolescents, especially young adolescents, assessment measures that are more cost effective, age appropriate but also warrant substantial content, are needed in order to expand the relevant research field.



One of the well-validated attachment measures suitable for adolescents is the Child Attachment Interview (CAI; Shmueli-Goetz, Target, Datta, & Fonagy, 2004). The CAI is particularly developed to assess the attachment system in middle childhood when the behavioural or representational measures are not sufficiently robust. Recently, the CAI has been further extended and validated for older children and adolescents from 7-16 years old (for the CAI review see Shmueli-Goetz et al., 2008; Venta, Shmueli-Goetz, & Sharp, 2014). Although the CAI is modified on the basis of the AAI in order to assess children's representations of attachment security to their parents and their overall state of mind regarding attachment, the CAI is more age appropriate, focusing on the child's perceived availability of each attachment figure in recent attachment experiences rather than more generalized past attachment experiences as in the AAI. The assessment of the representation of an individual parent within the ongoing attachment relationship not only takes into account children's memory and recall capacity (Damon & Hart, 1982; Fitzgerald & Lawrence, 1984), but also reflects careful consideration of the developing features of the attachment system where an integrated mind is not assumed in middle childhood or even in early adolescence (e.g. Furman & Simon, 2004). Throughout the interview, additional probes are used to elicit relevant instances or episodic details. The interviewer also provides scaffolding (Nelson, 1993) to assist the child in telling the story where necessary, i.e. giving nonspecific, interested comments. Therefore, compared to either the behavioural measures of attachment for younger children or the representational measures for adults, the conceptual and methodological considerations in the development of the CAI appear to be relatively more congruent with the tentative developmental characteristics of adolescent attachment.

The CAI is designed in the form of semi-structured interviews and the interview protocol consists of attachment questions that aim to elicit information about children's current attachment relationships and recent attachment-related events with the primary caregivers, especially in times of emotional upset, illness, separation and loss (CAI protocol, see Appendix). The overall interview takes between 30 and 60 minutes to complete. The coding and classification system of the CAI is partly derived from the Adult Attachment Interview classification system (Main et al., 1998), but also incorporates elements of behavioural coding, based on videotapes and segmented narratives, into relationship episodes (Luborsky & Crits-Christoph, 1998). The final scale of the CAI includes both a categorical system of attachment classifications (i.e.

Dismissing, Secure, Preoccupied and Disorganized) and nine linear-continuous subscales of attachment-related dimensions that reflect the child's overall current state of mind regarding attachment (Shmueli-Goetz et al., 2008). The subscales are Emotional Openness, Balance of Positive and Negative, Use of Examples, Anger Preoccupation, Morbid/Anxious Preoccupation, Idealization, Dismissal, Conflict Resolution and an Overall Coherence score. Among these, Anger Preoccupation, Morbid/Anxious Preoccupation, Idealization, and Dismissal are rated separately for the mother and the father. In particular, the three scales of Use of Examples, Balance of Positive/Negative qualities of the attachment figures, and most importantly the Overall Coherence are designed to capture the aspects of attachment narrative that indicate the degree of realism and integration of the representations of relationships with each parent (Shmueli-Goetz et al., 2008). A behavioural analysis of the child's responses during the interview is also carried out as an additional helpful indicator of attachment strategies, taking into account eye contact, changes in tone of voice, marked anxiety, changes of posture in relation to the interviewer as well as contradiction between verbal and non-verbal expressions.

For both normally developing children and those referred for mental health treatment, the CAI measure has demonstrated with great inter-rater reliability, excellent test-retest reliability over a 3-month and 1-year period, and good construct and discriminant validity (see Shmueli-Goetz et al., 2008; Target et al., 2003; Venta et al., 2014). As extensively reported by Shmueli-Goetz and her colleagues (2008), the inter-rater reliability among three expert judges coding 30 interviews randomly drawn from 226 reached strong agreement with a median ICC<sup>3</sup> of .88 for all the scales of the CAI except the scale of Idealization of Father<sup>4</sup>. Furthermore, the inter-rater reliability between two graduate-level students with limited knowledge of attachment theory or the measure after training arrived at a high correlation<sup>5</sup> of median .87 across 50 interviews. The inter-rater reliability with naïve coders across 68 interviews was reported to have high agreement of median  $r$  .81 with the exception of the scales of Involving Anger and Idealization of Father<sup>5</sup>. The inter-rater agreement using standard measure of kappa statistics for the main attachment classifications (secure vs. insecure) was also reported to be high by the three expert judges (kappa=.86), two graduate students (kappa=.81)

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<sup>3</sup> ICC=interclass correlation

<sup>4</sup> For an explanation of the low agreement on the scales, see (Shmueli-Goetz et al., 2008)

<sup>5</sup> The author used Pearson correlation for reporting inter-rater reliability between the two raters

and naïve coders ( $\kappa=.87$ ) respectively. In terms of test-retest reliability, it was reported that in the non-referred sample over a 3-month period ( $N=46$ ) most stability coefficients for CAI scales were high with a median of .69 (range from .29 to .90) and secure-insecure classifications were relatively stable (.69 for mother and .64 for father). Over a 1-year period ( $N=33$ ), the test-retest reliability of the CAI scales in the non-referred sample was reported to be moderate with a median correlation of .54 (range from .08 to .75) and the test-retest reliability of the secure-insecure classifications with mother was .67 and .52 with father.

The discriminative validity of the CAI measure was illustrated with non-statistical significance in a non-referred sample ( $N=161$ ) between attachment classifications and a number of variables including gender, age, socioeconomic status, ethnicity, parental household, verbal IQ and expressive language. In a referred sample ( $N=66$ ), except for the variable of gender, the attachment classifications were assigned independently of other demographic variables as well as verbal IQ and expressive language. The construct validity of the CAI measure was examined with an administered Separation Anxiety Test (Wright et al., 1995), Adult attachment Interview (George et al., 1985) and the Hampstead Child Adaptation Measure (Target, Fonagy, Schneider, Ensink, & Janes, 2000). It was reported that the CAIs reached 64% agreement with an independently coded attachment measure of Separation Anxiety Test ( $N=67$ ) and had highly significant association with Adult Attachment Interview ( $N=88$ ). Moreover, the primary caregivers of 86 children with Secure, Dismissing and Preoccupied attachment classifications also differed significantly on the global scales of the Hampstead Child Adaptation Measure (more detailed report see Shmueli-Goetz et al., 2008).

### ***Attachment Classifications***

Different attachment measures yield slightly different classification systems, however, the fundamental attachment styles remain relatively similar under the significant influences of the classification systems of the SSP and the AAI. In a broad way, the attachment patterns can be generally classified into two major groups - ***Organized Attachment Patterns*** and ***Disorganized Attachment Patterns*** - according to the nature of the child's corresponding attachment strategies. The Organized Attachment Pattern applies to individuals who have organized strategies for gaining the proximity of the

attachment figure in times of distress. Within the range of organized patterns, individuals can either securely or insecurely attach to the attachment figure as a result of the availability and responsiveness of the attachment figure in early relationships.

Ainsworth and colleagues (Ainsworth et al., 1978; Ainsworth & Wittig, 1969) have identified three major attachment patterns with distinctive characteristics based on the quality of attachment relationships and the capacity of the child to tolerate separation and re-establishment of interaction upon reunion. Organized Attachment Patterns are comprised of *Secure* (B) and *Insecure* organized attachments with the latter further distinguished into *Insecure-Avoidant* (A) and *Insecure-Ambivalent/Resistant* (C).

According to Ainsworth (1978) in the Strange Situation Procedure, a secure child is more harmonious and cooperative in his or her interactions with the attachment figure as well as able to use the figure as a secure base to explore the external world beyond the mother-infant dyad. After separation, the child is able to actively seek contact and re-establish interaction with mother in a more positive manner. Previous experiences of a consistent, sensitive and affectively attuned mother allow the child to tolerate negative feelings and remain relatively organized in separation or stressful situations (Grossmann, Grossmann, & Schwan, 1986; Sroufe, 1979, 1996). As the securely attached child develops, he or she is more likely to be seen as *cooperative, popular with peers, highly resilient* and *resourceful* around preschool age (Sroufe, 1983). Around age 6, they are reported to be friendly and can communicate with the parents in a free-flowing and easy manner (Main & Cassidy, 1988). Avoidant children in the strange situation tend to show little response to separation and display observable avoidance of proximity seeking upon reunion (Ainsworth et al, 1978). Based on the assumption of having had earlier experiences where their emotional arousal was not co-regulated and re-stabilized by the caregiver after being in distress, or where they were over-aroused as a result of intrusive/controlling parenting, avoidant children tend to over-regulate their affect or/and avoid situations that are likely to be distressing for them (Sroufe, 1996). At preschool age, insecure avoidant children are reported to be more *emotionally insulated, hostile and antisocial* (Sroufe, 1983), and later they tend to be distant from their parents and dismiss parents' attempt to communicate (Main & Cassidy, 1988).

Ambivalent/Resistant children are more likely to respond to a separation with immediate and intense distress followed by angry or passive behaviours towards the attachment figure upon reunion (Ainsworth et al., 1978). They are more tense and

impulsive as toddlers and may appear passive and helpless as pre-schoolers (Sroufe, 1983). Ambivalent/Resistant children tend to under-regulate affects and appear to be preoccupied with having contact with the caregiver, but remain frustrated even when the caregiver is available (Sroufe, 1996).

The other major attachment pattern in attachment measures identified by Main and Solomon (Lyons-Ruth & Block, 1996; Main & Hesse, 1990, 1992; Main & Solomon, 1986, 1990) is the **Disorganized/Disoriented** pattern that applies to children with disorganized strategies for coping with attachment anxiety. Disorganized children in the Strange Situation Procedure exhibit bizarre or contradictory behaviours that lack a coherent or organized strategy for dealing with the stress in times of separation, such as freezing, head banging, disoriented wanderings or the wish to escape the situation even in the presence of the caregiver. Largely due to the nature of the disorganized attachment style, it is difficult to unify the definition of this particular group, especially as it encompasses diverse forms of disorganized behaviours under the “Disorganized” title. There have been a number of attempts to differentiate subgroups within the classification of disorganized attachment. In two prospective longitudinal studies in low-risk samples of (Main & Cassidy, 1988; Wartner, Grossmann, Fremmer-Bombik, & Suess, 1994), and in van Ijzendoorn and colleagues’ (1999) meta-analysis study, there was a documented shift from disorganized behaviour with the mother during infancy to disorganized/controlling behaviour of either a punitive or caregiving type at age 6. Therefore, the subgroups of **insecure-controlling** and **insecure-unclassified** emerged. The insecure controlling group refers to a seeming “*attempt to control or direct the parent’s attention and behaviour and assumes a role that is usually considered more appropriate for a parent with reference to a child*” (Main & Cassidy, 1988, p419). Accordingly, two subgroups are further distinguished within **Insecure-controlling: controlling punitive** and **controlling caregiving**. According to Main and Cassidy’s (1988) description, the controlling-punitive child displays features of trying to humiliate, or reject the parent directly. The controlling caregiving child shows solicitous and protective behaviours towards the parents, or demonstrates care or concern, suggesting a role reversal (Main & Cassidy, 1988, p419). It should be noted that both categories of controlling children are disorganized at the representational level despite the seemingly organized pattern of their behaviours. A study conducted by Solomon, George and De Jong (1995) found a majority of the controlling-disorganized children “*depicted the self*

*and caregivers as both frightening and unpredictable or frightened and helpless*". For instance, controlling children's doll-play in a story completion task was found to be disorganized at the representational level with themes of catastrophe, violent fantasies and helplessness or complete inhibition of play (Main & Cassidy, 1988; Solomon et al., 1995). Research on disorganized children is incredibly valuable in the field of psychology as it provides a powerful insight into the associated significant family risk factors for child development and the subsequent impact on a child's mental health in later life (a systematic review see Lyons-Ruth & Jacobvitz, 2008). Extensive research findings have supported there being a strong association between children with disorganized attachment patterns and family risk factors such as maltreatment, depression or substance misuse (e.g. Carlson, 1998; Carlson, Cicchetti, Barnett, & Braunwald, 1989; Lyons - Ruth, Connell, Grunebaum, & Botein, 1990). Among these factors, frightened and frightening parental behaviours are found to be the most significant predictor for disorganized attachment patterns in children (e.g. Jacobvitz, Hazen, & Riggs, 1997; Lyons-Ruth, Bronfman, & Parsons, 1998; Schuengel, Bakermans-Kranenburg, & Van Ijzendoorn, 1999). The main hypothesis was primarily proposed by Main and Hesse (1990) that infants' experiences of frightening or frightened interactions with parents in moments of stress (e.g. unpredictable or confusing parental behaviours) are central to the development of disorganized attachment. It is a paradoxical situation that the attachment figure serves both as a source of fear and safety in times of stress, which leads to contradictory internal working models of self and other (i.e. tendencies of avoidance and proximity) and the collapse of attachment strategies. The link between such parental behaviours and disorganized attachment in children is not only found in the intergenerational transmission of disorganized attachment patterns with parents who are classified as "unresolved"<sup>6</sup> in the AAI (e.g. Hesse & Main, 1999; van Ijzendoorn, 1995), it has also been demonstrated in a low risk sample of presumably largely non-abusive parents. Frightened, threatening or dissociative parental behaviours can have severe consequences on child's attachment development and potentially result in disorganized attachment (e.g. Hesse & Main, 2006). Furthermore, in the course of their development,

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<sup>6</sup> Unresolved classification of AAI refers to interviews that are characterized by episodic memories of attachment related traumas or losses that are not well integrated between feeling and thinking when reporting memories of past attachment experiences. Attachment figures with unresolved memories of traumas or losses are often assigned an "unresolved" AAI classification. This is associated with disorganized early attachment in their children in Ainsworth's Strange Situation Procedure (Main & Hesse, 1990; Main & Solomon, 1990).

disorganized children were found to have an aggravated risk of various emerged psychopathologies, especially childhood aggression and externalizing behavioural problems (see Section 2.2.3 below).

Attachment classification on the basis of narrative analysis for older children and adults is mostly modelled on the AAI classification system (Main et al., 1998). The classification of attachment security is largely reflected in Grice's (1991) cooperative principle of rational discourse, in which the *Autonomous* (F) category is associated with high coherence, and the *Insecure Dismissing* (D), *Preoccupied* (E) and *Unresolved* (in relation to loss or abuse) (U) categories are linked with low levels of narrative coherence. Between the AAI system for adults and the SSP attachment classification for younger children, the identified attachment patterns are mostly conceptually and empirically congruent (e.g. van Ijzendoorn, 1995). The Autonomous category of the AAI corresponds to Secure attachment in infants, and the Insecure Dismissing and Preoccupied attachment categories can be mapped onto Avoidant attachment and Ambivalent/Resistant attachment respectively. As already mentioned, the Unresolved parental mental state (regarding loss or abuse) is equivalent to the Disorganized attachment pattern in children. The CAI classification system (Shmueli-Goetz et al., 2004) is congruent with the AAI classification and the SSP classification system includes *Secure* (S), *Insecure Dismissing* (D), *Preoccupied* (P) and *Disorganized* attachment categories. The CAI classification not only assesses representational levels of attachment security based on the recollections of affects and memories regarding current attachment experiences in the interview content, but also incorporates indices of behavioural analysis when assigning the attachment pattern. According to the CAI classification system (Shmueli-Goetz et al., 2004), securely attached children in the CAI are characterized by secure narrative accounts of affects and memories regarding attachment experiences especially in times of separation and distress and a relatively balanced view of the negative and positive aspects of the attachment figures. Insecure Dismissing children tend to overemphasize their independence and self-sufficiency even in times of hurt or illness, and appear to devalue their attachment relationships. Their memories of attachment experiences are often present but inconsistent, or absent, with rather limited associated affects. Their perceptions of the attachment figures in the interview are very likely to be idealized

where the negative qualities might be absent or mentioned but unelaborated on, and/or shortly deflected with positive qualities. Insecure Preoccupied attached children mainly reveal an overly caught-up mental state regarding attachment figures and/or attempt to involve the interviewer in repetitive themes or at times irrelevant examples of denigration and complaints about the relevant attachment figure. The predominant associated affect is anger or fear. The Disorganized pattern in the CAI is mainly characterized by manifestations of a controlling-withholding stance reflected in a subtle teasing on the part of the child, or even controlling-punitive behaviour in a more abusive form towards the interviewer. Other features include thought process and/or external behaviours reflecting disorganization at the representational level such as bizarre association or intrusion of catastrophic images, overly stimulated or abrupt changes of affects in response to loss or trauma, and atypical behaviours in the interview.

### **2.2.2 Continuities and Intergenerational Transmission of Attachment Security**

As originally proposed by Bowlby (1969, 1973, 1980) and later supported by numerous empirical findings, the major significance of early mother-infant attachment is its long-term impact on individual differences in later psychosocial functioning including various psychological disturbances (see Section 2.2.3). Hence, the continuities of attachment organization in the course of development as well as across generations become an essential research area, as it provides scope to understand the development and functions of attachment systems. More importantly, identification of various factors that can affect the continuities and discontinuities of attachment security potentially yield significant clinical value for altering insecure attachment organizations through intervention.

From infancy to adulthood, studies have found substantial continuities of attachment security across lifespan and even across generations (e.g. Benoit & Parker, 1994; Crowell, Treboux, & Waters, 2002; Grossmann, Grossmann, & Waters, 2006; Hamilton, 2000; Sroufe, 2005; Waters, Merrick, Treboux, Crowell, & Albersheim, 2000). However, studies have also found difficulties in identifying stability of



attachment security from infancy to adolescence (e.g. Becker-Stoll, Fremmer-Bombik, Wartner, Zimmermann, & Grossmann, 2008; Weinfield et al., 2004). Overall, it seems that at least from infancy to adolescence, the continuities of attachment security across different measures of attachment processes are still relatively limited. Although theoretically IWMs are considered to be relatively stable, in reality, considering the natural course of human development, it is conceivable that there are no significant long-term continuities of attachment, as the IWMs of attachment can adapt and change as a result of experience (Bowlby, 1973). The continuities of attachment security are more likely to be robust with a stable and relatively benign mediating condition in the ecology of family life. In contrast, attachment continuities may be disrupted by the presence of psychosocial stressors such as negative life events (e.g. Becker-Stoll et al., 2008; Waters, Weinfield, & Hamilton, 2000; Weinfield et al., 2004). For instance, in Weinfield and colleagues' longitudinal study (2004) in a high risk sample due to poverty at birth, there was no significant overall continuity found in attachment security from infancy to adolescence. Correlates of continuity and discontinuity are significantly associated with various factors at different ages including infant's temperament, maternal life stress, child maltreatment and family functioning at pre-adolescence. Furthermore, compared to organized infants, they also found that disorganized infants appeared to be more predictable in late adolescence as they were significantly more likely to be insecure or unresolved (Weinfield et al., 2004). In other studies, infants with disorganized attachment have shown modest short-term and long-term stability and a higher rate of attachment controlling behaviour in middle childhood (van Ijzendoorn et al., 1999).

Cross-generational continuities of attachment security are mainly demonstrated by the congruence between parents' attachment representations based on their early childhood experiences and the subsequent attachment patterns of their own infants in empirical research (e.g. Benoit & Parker, 1994; Fonagy, Steele, & Steele, 1991; Steele, Steele, & Fonagy, 1996; van Ijzendoorn, 1995). Specifically, some studies have identified that the key mediator is the parents' capacity to reflect mental states of their own and their caregivers' in past attachment experiences. This capacity is subsequently linked to parents' ability to think about their mental states in relation to their children as well as the children's minds (Fonagy et al., 1993; Fonagy, Steele, Steele, Moran, & Higgitt, 1991; Slade et al., 1999; Slade, Grienberger, Bernbach, Levy, & Locker, 2005). Such

a capacity in parents plays a vital role in understanding observed maternal sensitivity in mother-infant interactions, and their capacity to adapt to the child's developmental changes. In other words, the ability of parents to understand and potentially predict the mental states in self and other can be regarded as a key determinant of infant's development of self-organization including pathological self-development during the early attachment process (also see "Mentalization"; Fonagy, Gergely, & Jurist, 2004; Fonagy & Target, 1997). In terms of disorganized attachment, the intergenerational transmission of a disorganized attachment pattern appears to be linked with parents who have unresolved trauma in the AAI (e.g. Hesse & Main, 1999; van Ijzendoorn, 1995). As mentioned in Section 2.2.1, so far research evidence on disorganized attachment has suggested that particular types of frightened, frightening or dissociative parental behaviour is a strong predictor of children's disorganized attachment patterns even in low risk samples (e.g. Hesse & Main, 2006), whereas unresolved loss in secure mothers fails to predict disorganized attachment in their children (Schuengel et al., 1999).

The longitudinal research evidence of attachment continuities reviewed, shows a growing importance of attachment security in adolescence and adulthood and its implications for intergenerational transmission of attachment security and the drastic developmental transformations of attachment systems during adolescence (see Chapter 3). Adolescence is a critical time to examine the stability and predictors of change in attachment organization. Referencing studies of attachment stability in adulthood (Benoit & Parker, 1994; Crowell et al., 2002), the available empirical research findings on the stability of attachment during adolescence have shown that the internal organization of an individual's state of mind regarding attachment has substantially stabilized by middle adolescence, even in a high risk sample (Allen et al., 2004; Ammaniti et al., 2000; Zimmermann & Becker-Stoll, 2002). The intergenerational transmission link between maternal attachment security and adolescent's state of mind was found to be rather weak by middle to late adolescence (Allen et al., 2004) and such a relationship appeared to be mediated through current qualities of parent-adolescent interactions (Allen et al., 2003). Furthermore, Allen and colleagues' study (2004) examined familial, intrapsychic and environmental predictors of attachment change between age 16 and 18 years. According to their study, adolescents with an absence of major stressful experiences show an increased attachment security, as a result of growing maturity and experiences in new relationships. However, the presence of

negative stressors that overwhelm adolescents' capacity for affect regulation such as depressive symptoms, poverty and enmeshed overpersonalizing behaviour in parent-adolescent interactions that are not easily assuaged by parents, significantly predict declining security over time (Allen et al., 2004; also see Allen et al., 2003). The findings about adolescent attachment indicate that the attachment system during this stage is significantly different from the system in early childhood; however, it is still open for modification under the influence of the current environment as one moves towards the more mature and more integrated state of mind of adulthood.

### **2.2.3 Attachment and Psychopathology**

One of the major contributions of attachment theory is the notion that differences in security of mother-infant attachment at an early age can have a long-term impact on individual's later adaptations in cognitive, social and emotional development as well as psychological disturbances (Bowlby, 1969, 1973, 1980). Bowlby (1979/2005) postulated that a secure attachment could provide a healthier foundation for future development, whereas an insecure attachment to the primary attachment figure is more likely to be associated with difficulties in personality development and increased vulnerability to psychopathology (also see Bretherton & Munholland, 2008; Fonagy & Target, 1997). According to Bowlby (1979/2005), insecure attachment underlies many forms of emotional distress and personality disturbances, and different overt expressions of felt insecurity could be linked to specific types of psychological disturbances. In particular, the traits of Ambivalent/Resistant attachment marked by "*a tendency to make excessive demands on others and to be anxious and clingy when the attachment needs are not met*" were linked to pathologies such as dependent and hysterical personalities. Avoidant attachment with features of "*a blockage in the capacity to make deep relationships*" was postulated to be more likely to be present in individuals with affectionless and psychopathic personalities such as narcissistic personality disorders (Bowlby, 1973, p14). However, despite the links drawn by Bowlby, there is still limited theory or research examining the relationship between attachment patterns and the development of specific psychopathology with a more systematic approach to explaining the underlying mechanisms involved in disrupted personality development.

One of the most frequently investigated topics in attachment research is whether different attachment patterns can be associated with, or even be viewed as the causes of, particular types of psychopathology. Numerous empirical studies have found that early secure attachment to caregivers is associated with children's better psychosocial adjustment including sociability, compliance with parents, effective emotion regulation and a lower risk of emotional or behavioural disturbances up to preschool age and beyond (e.g. Ann Easterbrooks, Biesecker, & Lyons-Ruth, 2000; Grossmann & Grossmann, 1991; Main & Cassidy, 1988; Sroufe, 1983, 2005; Sroufe, Egeland, Carlson, & Collins, 2009; Wartner et al., 1994). Insecure attachment during infancy, at least in high social risk populations (with stressors such as poverty), has been observed to be associated with lower social competence, poor behavioural self-control, moodiness, and symptoms such as depression, anxiety and aggression in later childhood and adolescence (e.g. Fearon et al., 2010; Groh et al., 2012; Ogawa, Sroufe, Weinfield, Carlson, & Egeland, 1997; Sroufe et al., 2009; Warren, Huston, Egeland, & Sroufe, 1997; Weinfield, Sroufe, Egeland, & Carlson, 2008). Compared to the two Organized Insecure attachment patterns, the Disorganized attachment pattern is found to be associated with a higher prevalence of emotional and behavioural problems in later childhood, partly as a result of a lack of a consolidated or organized maladaptive mode of dealing with distress. Extensive evidence from longitudinal studies (e.g. Carlson, 1998; Lyons - Ruth, Alpern, & Repacholi, 1993; Moss, Cyr, & Dubois-Comtois, 2004), cross sectional studies (e.g. Moss, Rousseau, Parent, St-Laurent, & Saintonge, 1998; Solomon et al., 1995) and meta-analysis studies (e.g. Fearon et al., 2010; van Ijzendoorn et al., 1999) have consistently found the association between disorganized attachment and increased risk of aggression and externalizing behavioural problems.

Rather than attempt to draw a causal or direct link between attachment and psychopathology, one of the more plausible models of developmental psychopathology is to regard attachment security as a protective factor against psychopathology associated with adversity and trauma (Svanberg, 1998), and attachment insecurity as a risk factor for psychopathology (DeKlyen & Greenberg, 2008; Goodwin, 2003; Rutter & Sroufe, 2000). Protective factors mediate childhood adversity and promote resilience that enables an individual's successful adaptation after exposure to stressful life events. As one of the primary protective factors, attachment security mediates adversity and

trauma and defends against the development of severe psychopathology in later life. In contrast, vulnerability to psychopathology refers to individual's susceptibility to psychopathology associated with high-risk conditions, such as poverty, biological and genetic deficiencies, lack of family resources and support, and parental psychological disturbances (Werner, 1989). This approach to attachment, either as a protective factor or a risk factor, provides valuable answers to why some individuals with maltreatment experiences and other psychosocial disadvantages are more likely to develop severe psychopathology later in life, whereas others with the same conditions do not.

According to relevant research studies, past experiences of emotional responsive caregiving can mediate the effects of a high-risk environment and promote positive change for children who have encountered psychosocial stressors in their life (Egeland, Carlson, & Sroufe, 1993). When encountering family stress, children with a secure attachment history tend to have fewer problems than those with insecure attachment (e.g. Pianta, Egeland, & Sroufe, 1990) and they are also more likely to recover from behavioural problems (e.g. Sroufe, Egeland, & Kreutzer, 1990). By late adolescence and adulthood, attachment security is associated with healthier personality functioning such as more ego resilience, less anxiety, less hostility and better social support (see Kobak & Sceery, 1988) as well as better capacity for affect-regulation through interpersonal relatedness (e.g. Simpson, Rholes, Oriña, & Grich, 2002). As discussed, insecure attachment, disorganized insecure attachment in particular, is more likely to be associated with maladaptive personality functioning in high-risk conditions with the presence of stressors such as low socioeconomic status and parental mental health problems. The effect of insecure attachment can appear to be more salient when other stressors are present in the family ecology (Belsky, 1999; Belsky & Fearon, 2002; Kobak et al., 2006). For instance, in Shaw and colleagues' study (1996) exploring risk factors for disorganized attachment, maternal personality risk and child-rearing disagreements in predicting disruptive behaviours at the age of 5, disorganized attachment in infancy combined with the mother's perceived difficulty of the child in the second year significantly predicted higher aggression problems than only one of the two risk factors. Therefore, in short, it is important to recognize and appreciate the complexity of the developmental pathways between early attachment experiences and the development of psychopathology in a broader psychosocial context. The quality of attachment relationships or early caregiving experiences do not cause, or are not directly

linked to, personality functioning or later psychopathology, however, they are intimately involved in the developmental process. The function of attachment security, acting either as a resilience or vulnerability factor, may depend on an individual's past attachment experiences as well as the on-going context. As noted by Bowlby, adaptation is always the joint product of developmental history and current circumstances, for the reason that prior history is part of the current context, playing a role in selection, engagement, and interpretation of on-going experience as well as the use of available environmental support (Sroufe, Carlson, Levy, & Egeland, 1999).

Similarly, Fonagy (2001) pointed out:

“...Evidence is accumulating that suggests that, while the residue of early attachment might not be very apparent in overt functioning, it may have discernible effects on the mental processes that underpin personality and psychopathology. This evidence comes from studies that attempt to identify associations between attachment history and representational capacities concerning self, other, and self-other relationships... the early relationship environment is crucial not because it shapes the quality of subsequent relationships but because it serves to equip the individual with a mental processing system that will subsequently generate mental representations, including relationship representations” (p.31).

In most empirical research studies of adult attachment, cross-sectional methods are used to examine the relationship between attachment patterns and specific types of psychopathology. The adults' states of mind with respect to attachment are predominantly assessed by AAI's (George et al., 1985). According to the study conducted by Fonagy and colleagues (Fonagy et al., 1996), in a sample of nonpsychotic inpatients and controls using AAI's, it was found that psychiatric patients with disorders on Axis I and II were more likely to be Preoccupied and Unresolved regarding loss and abuse. In particular, on Axis I, anxiety was linked with Unresolved status in the AAI and AAI scales differentiated depression from eating disorders. On Axis II, borderline personality disorder was found to be associated with experience of severe trauma and lack of resolution in response to the trauma. The empirical findings with respect to the link between attachment patterns and psychopathology were somewhat inconsistent, similar to research studies of early attachment patterns and developmental psychopathology. In some other studies, depression was reported to be linked to both preoccupied attachment (Cole-Detke & Kobak, 1996) and dismissing attachment (Patrick, Hobson, Castle, Howard, & Maughan, 1994). In Manassis and colleagues'

study (1994), similar to Fonagy and colleagues' (1996) study, individuals with anxiety disorder were reported to be more likely to have Preoccupied and Unresolved states of mind. However such links were not found in the study conducted by Van Emmichoven and colleagues (2003). In contrast to the association between patients with eating disorders and Preoccupied attachment (Fonagy et al., 1996), women with eating disorders were found to be more likely to be associated with Dismissing attachment (Cole-Detke & Kobak, 1996). On Axis II, more consistent findings were reported regarding schizophrenia, in which the majority were classified as having Dismissing (Dozier, Cue, & Barnett, 1994) or Unresolved states of mind (Tyrrell, Dozier, Teague, & Fallot, 1999). Both Borderline Personality Disorder and Antisocial Personality Disorder were reported to be associated with Dismissing and Unresolved states of mind (Barone, 2003; Patrick et al., 1994; Stovall - Mcclough & Cloitre, 2003). However, it could be argued that some of the consistent findings of the links between individuals' attachment states of mind and specific types of psychopathology in these empirical studies are based on the phenomena that the Unresolved state of mind is predominant or over-represented in psychiatric samples and psychiatric disorders are often associated with insecure states of mind (Kobak et al., 2006). However, the cross-sectional study design does not allow us to draw a causal link between adult attachment states of mind and psychopathology. The attachment states of mind may be disrupted by symptoms of psychological disturbances, or the AAI coding system of the discourse analysis may correspond to these symptoms.

### **2.3 Limitations of Current Attachment Theory and Studies**

So far, some of the main ideas of attachment theory and the studies reviewed have demonstrated that the attachment approach has made tremendous contributions to understanding early experiences of mother-infant relationships and their life-long implications for personality development and emergence of psychopathology. However, as already mentioned in this section, there are still certain limitations of attachment theory and research studies.

In terms of the theoretical approach, attachment theory has incorporated biological,

cognitive and developmental perspectives in order to understand the relational and dynamic nature of attachment behaviours in early parent-child relationships and the long-term impact on personality development. Integration with developmental principles from a cognitive perspective has been viewed as driving the developmental move from attachment behaviours to attachment representations, however, such cognitive-developmental principles were not fully applied in understanding aspects of the process of internalization in secure and insecure IWMs (Blatt & Levy, 2003; Levy & Blatt, 1999). Despite the differences in attachment measures and the diagnosis of psychopathology, the conceptualization of limited attachment prototypes of secure and insecure patterns is one of the difficulties that arises in attempts to reconcile insecure attachment representations and psychopathology (Dozier et al., 2008). Furthermore, the categories of attachment prototypes are too general to permit the development of a model that may generate specific treatment (Rutter & O'Connor, 1999).

The predominant classification systems of attachment are mainly based on the content of attachment representation emphasising the quality of working models of self and others (Blatt & Levy, 2003; Levy & Blatt, 1999). According to the Bartholomew and Horowitz classification system (1991), secure attachment has positive models of self and others, whereas preoccupied attachment includes positive models of others and negative models of self, dismissing attachment involves a defensively positive model of self and negative models of others, and fearful attachment contains relatively negative models of both self and others. Such primary emphasis on the quality of attachment patterns may overlook the intricate developmental differences within each of the attachment representational structures. As addressed by Levy and Blatt (1999), different attachment patterns also involve differences in the structures of the IWMs in terms of varying levels of differentiation and integration. The underlying structures of the working models may be more likely than the content to result in different capacities and potentials for adaptations (Diamond & Blatt, 1994; Levy et al., 1998). Therefore, psychoanalytic and social cognitive development of mental representations (Blatt & Blass, 1992; Blatt & Levy, 2003; Bretherton, 1999; Levy & Blatt, 1999; Levy et al., 1998) are advocated to benefit the understanding of the IWMs in attachment theory by elaborating and articulating a more developmental, intricate and sophisticated perspective on various different levels of personality functioning within each insecure attachment pattern and further providing a more continuous model linking attachment to



psychopathology.

Another limitation of attachment research is the methodology of cross-sectional studies. In empirical attachment studies, cross-sectional studies that associate parent-child attachment security with various risk factors and child psychosocial adaptation or maladaptation are productive in illustrating the significant role of attachment security in personality development at various ages. However, due to the features of cross-sectional studies, it is impossible to infer any causal link between attachment security and risk factors or between quality of attachment relationships and developmental outcomes. For instance, security of attachment in adolescence was observed to be associated with maternal attunement in a cross-sectional study (Allen et al., 2003), however, maternal attunement was not predictive of changes in levels of security in a two-year longitudinal change study (Allen et al., 2004). As can be seen, it is more likely that the observed association between maternal attunement and attachment security is a result of the effects of attachment security on maternal behaviours rather than the other way around. However, longitudinal attachment studies can not establish clear causal relationships. As already discussed in the above section, the effects of early attachment experiences on individual's later psychosocial functioning or psychological disturbances are rather inconsistent. The results appear to be significant only when taking into account other risk factors (e.g. Belsky, 1999; Belsky & Fearon, 2002; Kobak et al., 2006; Shaw et al., 1996). Studies of low risk samples have often failed to identify relationships between early insecure attachment and emotional or behavioural problems in middle childhood (e.g. Feiring & Lewis, 1996). Nevertheless, longitudinal studies have provided valuable resources to establish multiple potential development pathways from an early relationship environment. It should always be noted that attachment security is only one of many predictors of child development and mental health. Over-emphasizing the role of early attachment experiences may under-represent or undermine the influences of other significant factors such as temperament, gender, psychosocial distress to the family and social-cultural influences (see Chapter 1).

Although with certain limitations, early attachment experiences undeniably have some significant impact on personality development and psychological disturbance. As addressed by Fonagy (2001), one potential developmental model to bridge the gap between attachment and personality and psychopathology is the notion of “*a mental*

*processing system that will subsequently generate mental representations*”. Blatt and his colleagues’ formulation of the development of mental representations of self and other, as outlined in Chapter 1, precisely provides a structural psychodynamic framework that enables us to establish further continuities between attachment patterns, personality development and psychological disturbances.

## **2.4 A Two Polarities Model in Attachment**

In Blatt’s polarity model, secure attachment reflects a capacity to establish mature, reciprocal and relatively satisfying interpersonal relationships as well as an essentially differentiated and integrated sense of self. It can be viewed as a well-balanced integration of the two fundamental developmental dimensions of interpersonal relatedness and self-definition, as secure attachment involves both a capacity to establish affective bonds and to tolerate and benefit from separation (Blatt & Levy, 2003; Mikulincer & Shaver, 2007). However, as discussed in Chapter 1, severe disruptions in the dialectic transactions of relatedness and self-definition, at different developmental levels, can lead to distorted or exaggerated preoccupation with one dimension at the expense of the other (Blatt, 1990, 2008; Blatt & Blass, 1990; Blatt & Shichman, 1983; Jordan, 1986; Miller, 1984; Stern, 1985; Surrey, 1985). This defensive preoccupation of relatedness or of self-definition is largely consistent with the differentiation of insecure attachment patterns. In a way, Blatt’s polarity model can provide another conceptual basis for differentiating among the major types of insecure attachment. Evidence from attachment research has indicated that there are fundamental distinctions between the Preoccupied (Ambivalent/Resistant) and the Dismissing (Avoidant) attachment patterns from infancy to childhood to adolescence and adulthood (e.g. Ainsworth et al., 1978; Bartholomew & Horowitz, 1991; Hazan & Shaver, 1987; Main et al., 1985; West & Sheldon, 1988). Through the lens of the polarities model, the preoccupied attachment pattern can be viewed as associated with exaggeration and distortion of the developmental line of interpersonal relatedness at the expense of the development of self-definition and the dismissing attachment pattern can be linked to disturbances in the developmental line of self-definition at the expense of the relatedness dimension (Blatt & Homann, 1992; Blatt & Maroudas, 1992; Levy et al., 1998; Pilkonis, 1988; Zuroff & Fitzpatrick, 1995). Individuals with Preoccupied

(Ambivalent/Resistant) attachment patterns overly emphasizing the relatedness dimension tend to have an intense preoccupation to desperately maintain contact with the need-gratifying figure due to felt insecurity, and therefore the Preoccupied usually are characterized by considerable anxiety in response to separation and loss (Blatt & Levy, 2003; Levy & Blatt, 1999). Dismissing (Avoidant) attachment emphasizing self-definition can be characterized by avoiding contact with the attachment figure as a result of defensive expressions of exaggerated autonomy and independence to deal with loss (Blatt & Levy, 2003; Levy & Blatt, 1999). Furthermore, recent research on the Disorganized insecure attachment also suggests that two subtypes could be identified in a similarly polarized manner, Disorganized-Avoidant and Disorganized-Approach which are mapped onto an emphasis on self-definition and interpersonal relatedness respectively (Lyons-Ruth, 2002).

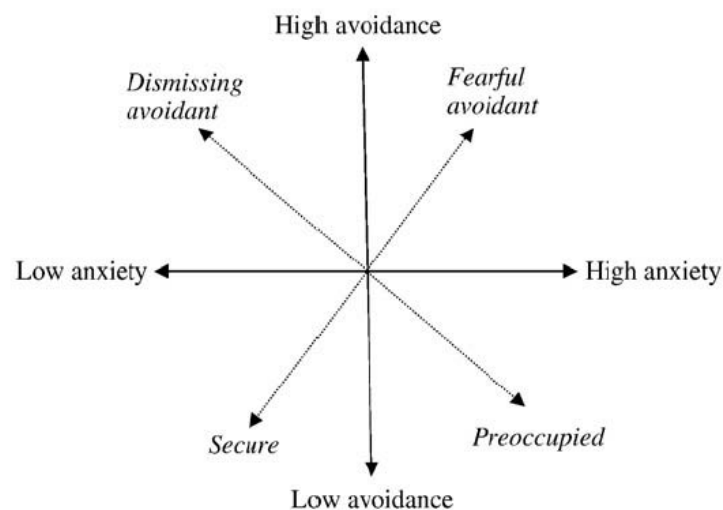
On top of the two insecure attachment patterns differentiated using the polarities model, further developmental levels were found within each of the two major attachment insecure patterns in adolescents and adults. As previously mentioned in Chapter 1, different developmental levels of mental representation allow us to examine different levels of functioning within the IWMs. Within the Dismissing/Avoidant attachment pattern, it was found that two subgroups could be identified, fearful and a dismissing avoidant patterns (Bartholomew & Horowitz, 1991; Brennan, Clark, & Shaver, 1998; Brennan & Shaver, 1995). Individuals with fearful avoidant attachment are characterized by “*a conscious desire for relatedness that is inhibited by fears of its consequences*” and the self is characterized as “*low self-esteem, hesitant, shy, lonely, vulnerable, dependent, self-critical, afraid of rejection, and lacking in social confidence*”, according to Bartholomew and Horowitz (1991). The dismissive avoidant are characterized by “*an intense defensive denial of the need or desire for relatedness*” and they tend to view the self as “*high in self-esteem, socially self-confident unemotional, independent, cynical, critical of and distant from others, and more interested in achievement than in interpersonal relationships*”, as opposed to others’ view of them (Kobak & Sceery, 1988) as “*hostile, socially autocratic, and less ego resilient*” (Blatt, 1995). According to Levy and colleagues’ study (1998) on the individual differences in developmental levels of mental representations between the fearful avoidant and the dismissive avoidant, it was found that dismissively avoidant individuals were less differentiated between self and other at the representational level

and their narratives were largely polarized on either idealization or denigration of the significant object with little complexity or tolerance of ambivalence as compared to the fearful avoidant ones who had relatively greater ambivalence of both negative and positive aspects of their parents. This finding suggests that individuals with dismissive avoidant attachment are less adaptive than those with fearful avoidant attachment within the broader Dismissing/Avoidant category, as they were at a lower conceptual level of the differentiation-relatedness of self and other. Similarly, at least two developmental levels of the compulsive-caregiving and compulsive-careseeking can also be differentiated within the Preoccupied/Ambivalent insecure attachment pattern (West, Sheldon, & Reiffer, 1987). Although both subtypes are preoccupied by anxiety in interpersonal relatedness, the compulsive-caregiving individuals were found to be more mature and integrated than the compulsive-careseeking ones, as the people with compulsive-careseeking attachment pattern “*seek unilateral relationships that provide contact, nurturance, gratification, support, approval and acceptance from others*” (Blatt, 1995). Further empirical study conducted by Schaffer (1993) has found that the compulsive-careseekers were reported to have higher levels of dependency, self-criticism and anxiety and lower levels of self-efficacy and modes of affect regulation than the compulsive-caregivers. The compulsive-caregivers act out a role reversal, providing the care they did not receive and wished for (Blatt, Quinlan, Chevron, McDonald, & Zuroff, 1982), which may be a result of an early experience of being treated as an attachment figure by the parent (Blatt & Levy, 2003). According to Schaffer’s study (1993), people with compulsive-caregiving attachment appear to be more adaptive with a higher developmental level of mental representation and may leave greater potential for establishing reciprocity and mutuality in providing as well as receiving care and affection (Blatt & Levy, 2003). These different developmental levels within the Preoccupied/Ambivalent insecure attachment are also illustrated by the two types of relatedness within the Dependency factor in the Depressive Experiences Questionnaire (see Blatt, Hart, Quinlan, Leadbeater, & Auerbach, 1993). Blatt and his colleagues have developed a well-validated self-report Depressive Experiences Questionnaire (Blatt, D’Afflitti, et al., 1976) which measures the degrees of anaclitic and introjective tendencies. Under the three major factors identified (dependency, self-criticism and efficacy) and validated across a number of empirical studies (Blatt & Zuroff, 1992), two different subscales within the Dependency factor were differentiated. One subscale is characterized by an anaclitic dependency or neediness that expresses

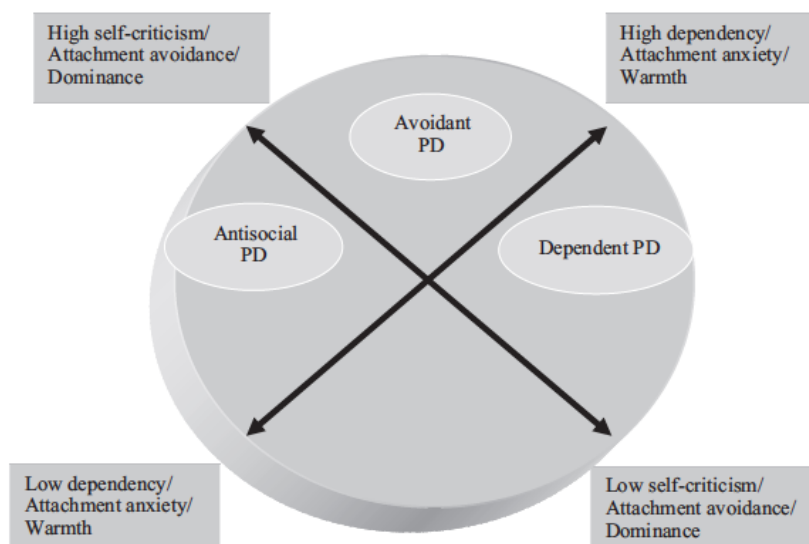
concerns about feelings of helplessness, fears and apprehensions about separation and rejection, and about loss of gratification and experiences of frustration. The other scale refers predominately to relatedness concerns and feeling of sadness and loneliness in response to disruption of a specific relationship. Between these two types of dependency, anaclitic dependency or neediness was found to have more significant correlations with measures of depression, and relatedness concerns were found to have more significant correlations with measures of self-esteem (Blatt et al., 1993). In other words, the differentiation between these two types of dependency further supports the hypothesis that there is a differentiation of levels of personality functioning and maturity within interpersonal relatedness.

In consonance with the two polarities model, there is an increasing consensus these days about the two fundamental dimensions underlying different developmental levels in the IWMs - attachment avoidance and attachment anxiety (e.g. Brennan et al., 1998; Meyer & Pilkonis, 2005; Mikulincer & Shaver, 2007). As illustrated below in *Figure 2.1*, the attachment model incorporates the two polarity dimensions of anxiety and avoidance (Mikulincer & Shaver, 2007) as well as the further four attachment categories of secure, dismissing avoidant, fearful avoidant and preoccupied (Bartholomew & Horowitz, 1991) sitting between the two central axes. The dimension of anxiety in the attachment model defined as “fear of rejection and abandonment” (Mikulincer & Shaver, 2007, p91) is related to the interpersonal relatedness dimension of Blatt’s two polarities model, which is characterised by exaggerated emphasis of issues of relatedness at the expense of the development of self-definition. Similarly, the avoidant attachment dimension characterised by “*discomfort with closeness and with discomfort depending on others*” (Mikulincer & Shaver, 2007, p87) can be linked to the self-definition dimension of the two polarities model with maladaptive expressions of exaggerated autonomy and independence. The further four categories of attachment patterns with differences in the IWMs of self and of the attachment figure are characterized by varying degrees of emphasis on relatedness or self-definition or both (Bartholomew & Horowitz, 1991). Such theoretical links between attachment dimensions and the two fundamental polarities of self-definition and interpersonal relatedness provide a comprehensive theoretical framework to understand the differences among and within different attachment patterns from a different perspective.

Empirical evidence also supports the conceptual link between the fundamental dimensions of attachment and the two polarities model of relatedness and self-definition (Sibley, 2007). It was found that maladaptive emphasis on relatedness at the expense of self-definition is more closely linked to the Preoccupied attachment pattern with high anxiety and low avoidance, whereas exaggerated attempts to maintain the sense of self-definition are associated with Dismissing Avoidant pattern with high avoidance and low anxiety (Murphy & Bates, 1997; Zuroff & Fitzpatrick, 1995; review see Luyten et al., 2005). The characteristics of Fearful Avoidant attachment, described above (Bartholomew & Horowitz, 1991), are marked with high introjective traits but also with a conflicting approach, avoidant in interpersonal relationships. This more closely matches the quadrant of high avoidance and high anxiety (Luyten et al., 2005).



**Figure 2.1 Two-Dimensional Space Defined by Attachment Anxiety and Avoidance** (based on Bartholomew & Horowitz, 1991; Mikulincer & Shaver, 2007 cited from Luyten & Blatt 2011)



**Figure 2.2 A Prototype Approach to Personality Disorder Based on Two-Polarities Models** (work based on Horowitz et al., 2006; Luyten & Blatt, 2011; Meyer & Pilkonis, 2005; Pincus, 2005 cited from Luyten & Blatt, 2013)

Based on the underlying fundamental dimensions of relatedness and self-definition, some recent attachment studies consistent with Blatt's two polarities model support the links between different insecure attachment patterns and different types of psychopathology including symptom disorders on Axis I and personality disorders on Axis II of the DSM-IV (American Psychiatric Association, 1994). Based on the two polarities model, the two major patterns of insecure attachment can be differentiated to link with two distinctive types of depression (Blatt, 1974; Blatt & Homann, 1992; Blatt & Maroudas, 1992; Blatt & Zuroff, 1992). Preoccupied insecure attachment is linked with an anaclitic type of depression that concerns exaggerated attempts to maintain interpersonal relationships, marked by fears of abandonment and loneliness (Blatt, 1974, 2008). Dismissing attachment, reflecting an expression of exaggerated attempts to maintain the sense of self, is found to be more likely to be associated with an introjective type of depression (Blatt, 1974), characterized by fears of annihilation, intense feelings of inadequacy, worthlessness, and guilt (Blatt, 2008; Blatt & Homann, 1992; Zuroff & Fitzpatrick, 1995). In terms of personality disorders, as illustrated in *Figure 2.2*, empirical studies have overall found that resistant attachment is more likely to be associated with borderline, dependent and passive-aggressive personality disorders, fearful avoidant attachment is linked to avoidant and schizoid personality disorders, and

dismissing attachment is linked to narcissistic, antisocial and paranoid personality disorders (e.g. Alexander, 1993; Alexander & Anderson, 1994; Brennan & Shaver, 1998; Levy, 1993; Meyer, Pilkonis, Proietti, Heape, & Egan, 2001; Rosenstein & Horowitz, 1996).

This unified approach to attachment and psychopathology within the two polarities theoretical framework may explain the inconsistent evidence found in some of the previous studies in which specific psychopathology was found to be linked to different attachment patterns. The diagnosed psychopathology, with varying degrees of emphasis on self-definition and interpersonal relatedness, corresponds to different levels of functioning with respect to the two fundamental dimensions within each insecure attachment pattern. This explains, in a way, why some depression studies link depression with Preoccupied attachment (Cole-Detke & Kobak, 1996; Fonagy et al., 1996), whereas other studies link it with Dismissing attachment (Patrick et al., 1994). Anxiety disorders were found to be associated with Preoccupied attachment in some studies (Fonagy et al., 1996; Manassis et al., 1994), but not in others (Van Emmichoven et al., 2003). Similarly, patients with eating disorders were reported to be more likely to have Preoccupied attachment (Fonagy et al., 1996), as well as Dismissing attachment (Cole-Detke & Kobak, 1996). In other words, the dynamic approach of conceptualizing psychopathology in the two polarities model marks a significant shift in understanding psychopathology from a static symptom-based categorical diagnostic system to an etiologically based dimensional approach based on personality development and personality organization (Brown & Barlow, 2005; Clark, 2005; Luyten & Blatt, 2011).

With the integrative framework between the polarities model and attachment, the two fundamental dimensions of self-definition and relatedness provide a comprehensive conceptual and empirical basis for differentiation between the two major insecure attachment patterns of Dismissing/Avoidant and Preoccupied as well as different attachment categories of Secure, Dismissive Avoidant, Fearful Avoidant and Preoccupied. Within each of the attachment patterns, different developmental levels of mental representation of self and others, as outlined in Chapter 1, allow us to identify different developmental levels of functioning within different patterns of internal working models including the broad attachment classifications of Dismissing, Preoccupied and Disorganized. In light of the limitations of attachment theory and



research mentioned in the previous section, the integrative approach of attachment theory and the two polarities model in personality development, defined by the underlying fundamental developmental lines of interpersonal relatedness and self-definition, allows us to establish theoretical continuities and draw a closer link among attachment patterns, especially insecure attachment, and the development of psychopathology (*Figure 1.3*). This integrative approach also provides the potential for treatment of psychological disturbances consistent with varying degrees of distorted emphasis of issues of self-definition and interpersonal relatedness.

## Chapter 3. Adolescent Development and Adolescent Twins

### 3.1 Introduction

Freud (1905) described adolescent development as one of the “*most significant, but also one of the most painful, psychical achievements of the pubertal period... a process that alone makes possible the opposition, which is so important for the progress of civilization, between the new generation and the old*” (p.227). There is no doubt that adolescence is a significantly productive but equally challenging stage in personality development bridging childhood and mature adulthood. In psychoanalysis, theories of adolescent development grounded in Freud’s libido theory have largely stressed the intrapsychic development of adolescence (see Freud, 1958; Spiegel, 1951). The adolescent stage is generally viewed as having internal frustrations of the qualitative and quantitative transformations of psychic structures in order to accommodate the new, mature forms of adult sexuality. In later object-relations theory, with significant contributions from psychoanalysts such as Katan (1951), Anna Freud (1958), Erikson (1959), Blos (1962) and many others (for review see Spiegel, 1951), the emphasis of adolescent development tentatively shifted to the process of libidinal attachment, the removal of attachment from the primary object to a new sexual object outside of the family. Such an approach is, in part, congruent with attachment theory on adolescence. According to attachment theory, during adolescence children are going through dramatic transformations in the emotional, cognitive and behavioural systems that surround attachment relationships (Allen, 2008). The new cognitive development of formal operational thinking (Inhelder & Piaget, 1958) allows adolescents to review their earlier attachment relationships and begin to reconstruct a more integrated and generalized stance toward attachment experiences at a representational level (Hesse, 2008; Main et al., 1985). Allen (2008) characterizes the normal development of the attachment system in adolescence as moving from attachment relationships to generalized states of mind regarding attachment processes in relationships, achieving independence from attachment figures, continuing influences of current relationships with primary caregivers and extending attachments beyond a child-caregiver relationship to peer relationships and romantic love. Although it is not discussed here, both in psychoanalysis and attachment theory, body and sexual puberty transformations

are significant developmental changes during adolescence which have paramount influences on the perception of self and of others (see Ammaniti & Sergi, 2003).

Although different theories of adolescent development have varying degrees of emphasis on the dimensions of self-definition and interpersonal relatedness (see Chapter 1), the developmental processes of the two polarities are interrelated and mutually facilitating (Blatt, 1990; Blatt & Blass, 1990; Blatt & Shichman, 1983; Jordan, 1986; Miller, 1984; Stern, 1985; Surrey, 1985). As illustrated in Erikson's (1959, 1968) epigenetic psychosocial model, the crucial period of adolescence is where previously internalized experiences of self and others start to integrate into a single continuum of self-identity (see Chapter 1, *Figure 1.2*). The psychological mechanisms of personality development gradually shift from internalization and identification to integration (Blatt & Blass, 1990, 1992, 1996). Therefore, adolescence is an important time in the synergistic dialectic developmental transaction between two fundamental dimensions of interpersonal relatedness and self-definition. Successful integration between the two dimensions results in the formation of a more consolidated self-identity and positive relatedness to others, whereas failure of integration may lead to the emergence or consolidation of many forms of psychopathology. Personality disorders especially are characterized by failure to integrate the two fundamental developmental dimensions (Blatt & Blass, 1990; Blatt & Luyten, 2009). Compared to adults, it is only recently that a body of research has emerged to start exploring the great value of the two polarities model for understanding normal and disrupted personality development in adolescence (see Section 3.4).

For the purpose of study, this thesis uses monozygotic and dizygotic adolescent twins to examine the degrees of genetic and environmental influences on mental representations of self and other. Thus, the nature of the twin relationship, especially at adolescent age, is reviewed here. Twins have long been of interest as psychology subjects. Since the age of Galton (1865), twins have been widely used in behavioural-genetic research as natural comparisons to yield information about individual differences in complex human traits that are attributed to heredity and environmental influences. Although twins are primarily used as a tool for behavioural-genetic studies (Bouchard, 2004), the twin relationship itself has been considered one of the most unique and intimate interpersonal relationships in psychoanalytic studies (e.g. Athanassiou, 1986; Burlingham, 1946, 1949, 1952, 1963; Hartmann, 1934; Joseph, 1961), and recently in

attachment studies (e.g. Fraley & Tancredy, 2012; Lytton, 1980; Neyer, 2002a; Neyer, 2002b; Segal & Ream, 1998; Woodward, 1998). Yet, compared to extensive studies of twins in behavioural-genetic research, the resources to understand the nature of twin relationships are still sparse. The experience of being a twin, the genetic and epigenetic similarity between them, the long-term special bond they have from birth and the special ways they interrelate are all fascinating subjects in psychology (Dimitrovsky, 1989). For instance, in the psychoanalytic literature, twin experience is considered to have a profound effect on personality development especially when it comes to the mutual inter-identification and diffuse ego boundary or partial fusion between twins (e.g. Athanassiou, 1986; Demarest & Winestine, 1955; Orr, 1941; Ortmeyer, 1970). The psychic relatedness of twins and identity fusion are regarded as a tremendously challenging developmental task in personality development as well as a major theme in twin's therapeutic analysis (e.g. Cronin, 1933; Dimitrovsky, 1989; Lacombe, 1959). In Burlingham's (1952) treatment of a pair of twins, a crucial point was revealed in the significant period of adolescence addressing the unique characteristic of twin development during this stage. He pointed out that "adolescent revolt" against the love objects of infancy demands the breaking of the tie to the twin equally as much as the breaking of the tie to the mother, since the libidinal cathexis of the twin is rooted in the same deep layer of the personality structure as the early attachment to the mother. Consequently, the withdrawal of cathexis in the adolescence phase may be accompanied by an equal amount of structural upheaval, emotional upset and likelihood of resulting symptom formation (Burlingham, 1952; Freud, 1958). Therefore, failure to detach from the co-twin renders relatively equivalently severe consequences as failure to detach from the primary object of the mother at the adolescent stage. In short, in the normal developmental process, twins are not only facing the developmental challenge inherent in non-twin siblings, but also such a developmental task is combined with difficulties stemming from their twinship. Hence, the process of separation and individuation as well as the formation of self-identity during adolescence can be inferred to be one of the most challenging tasks for twins, especially identical twins.

Some attachment studies have presented a similarly negative view of twin's personality development as psychoanalytic studies, for the main reason that twinship may interfere with the quality of their attachment bonds to the mother as early as infancy (e.g. Lytton, 1980). However, other more recent attachment studies on twin relationships have

thrown a more positive light on twin's personality development compared to psychoanalytic studies. In attachment theory, the attachment figure does not generally refer to any significant person in a highly interdependent relationship, as an attachment relationship serves a unique psychological function of providing felt security (Ainsworth, 1991; Bretherton, 1985; Cassidy, 2008). Although the mother does not play an exclusive role as attachment figure, at least in Western culture, observational studies have reported that the mother still tends to be the preferred attachment figure in the attachment hierarchies (Lamb, 1978; Lytton, 1980). Considering that siblings may serve as attachment figures (Ainsworth, 1991), the existence of attachment hierarchies (Ainsworth, 1991; Bowlby, 1969; Collins & Read, 1994a; Trinke & Bartholomew, 1997), the child's growing ability to extend the network of attachment to multiple attachment relationships (e.g. Doherty & Feeney, 2004; Fraley & Davis, 1997), and the special bond between twins (e.g. Burlingham, 1952; Segal & Ream, 1998; Woodward, 1998), it is tempting to hypothesize that twins may serve attachment functions to each other as attachment figures or when the primary attachment figure of the mother is inaccessible in some circumstances. Some researchers such as Tancredy and Fraley (2006) have used attachment theory to understand the twin relationship and hypothesized that twin attachment may differ from other attachments during the developmental course. In their empirical study (Fraley & Tancredy, 2012) of a national representative sample of more than 24,000 people with siblings, the average siblings attachment scores obtained by survey were compared between twin siblings and non-twin siblings. It was found that twins were more likely than non-twin siblings to use their sibling as an attachment figure due to factors such as their genetic relatedness, empathy and shared experiences. Based on such an assumption, that a twin relationship may function as an attachment relationship to some extent, twinship may potentially yield some positive influences on the sibling's personality development especially when the primary attachment figure is inaccessible.

In this chapter, adolescent development will be reviewed in terms of the development of self-definition and interpersonal relatedness including theoretical perspectives of object relations theory, attachment theory and the integrative approach of Erikson's epigenetic psychosocial model. Following that, the development of twins in adolescence is particularly addressed by psychoanalytic literature and recent attachment studies on twin attachment, as the nature of the twin relationship has often been overlooked in

research studies, especially behavioural-genetic studies. The last section of this chapter will be focused on psychological disturbances in adolescence, the prevalence of externalizing and internalizing disorders and their links to disturbances in the dimensions of self-definition and interpersonal relatedness. Furthermore, some prior research studies on adolescent mental representations and their association with psychological disturbances are reviewed with a special highlight on depression studies and the inter-generational transmission of personality vulnerability for depression in adolescence.

### **3.2 Interpersonal Relatedness and Self-Definition in Adolescent Development**

More than any other time of life, adolescence is a period where the conflicts between intrapsychic development and external influences are highly intensified, and the interplay between issues of self-definition and interpersonal relationships can have significant impact on the development outcome. In the dimension of self-definition, adolescence is regarded as a critical developmental process of separation and individuation through which the adolescent is loosening infantile object ties and starts to construct a consolidated self-identity with increasing independence from parents (Blos, 1962; Deutsch, 1944; Erikson, 1968; Freud, 1905). From a relatively simplified viewpoint, the primary developmental task during adolescence can be regarded as achieving autonomy and independence. Primarily following the line of attachment theory, the interpersonal relatedness dimension of adolescent development can be viewed as concerned with the drastic transformation of psychological mechanisms involved in the attachment system. The adolescent's independence from attachment figures grows, while at the same time maintaining positive attachment relationships, and extending attachment beyond the family context (Allen, 2008). As discussed in Chapter 1, the two polarities of self-definition and relatedness are interdependent in the process of personality development, therefore, an adaptive transition of adolescence may well depend on maintaining the balance between the two dimensions. Furthermore, as will be elaborated upon later in this chapter, adolescent's ability to maintain the balance between self-definition and interpersonal relatedness at this critical stage is not only influenced by their internalized experiences of interpersonal relationships and of self

prior to the adolescent age, it is also influenced by the quality of their current relationships with parents as well as the parents' mental capacity to adapt to the child's drastic developmental changes.

### **3.2.1 Object Relations Theory of Adolescent Development**

In object relations theory of adolescent development, Blos (1979) maintained that adolescence can be viewed as a second separation-individuation process after toddlerhood and he characterised this process as “*the shedding of family dependencies [and] the loosening of infantile object tie...[which] render the constancy of self-esteem and of mood increasingly independent from external sources*” (pp.142-143). This description of adolescent development primarily emphasizes the process of libidinal attachment removal from the primary object (Freud, 1958; Freud, 1905; Jacobson, 1964; Katan, 1951). Accordingly, in a developmental sequence, the first primary developmental task during adolescence is to achieve autonomy and growing independence from parents. However, it should be noted that this “autonomy” (Esman, 1985) can only be achieved in the context of a mature separation-individuation process in which the establishment of a consolidated self involves a sense of self without isolation or alienation and a sense of relatedness without enmeshment or fusion. In other words, autonomy in adolescence is based on the balance between self-definition and interpersonal relatedness, which will be further elaborated on in the rest of this section. The second primary stage of adolescence after detaching the libidinal attachment from the primary object is to seek new cathecting objects outside the family (Freud, 1905). In other words, the emphasis on later adolescent development and young adulthood has shifted to interpersonal relationships in a wider context. The relational capacity to be intimate with others also largely depends on the development of a differentiated and consolidated sense of self.

In light of these two stages of object relations development of adolescence, the object constancy and self constancy developed in the previous stages (Blatt & Lerner, 1983a) once again face significant challenges (also see Meissner, 2009). Consequently, on the basis of the levels of object representations theorized by Blatt (see Chapter 4),

adolescents during the developmental process may manifest dramatic oscillations between polarized expressions or a strong preoccupation with issues of control and autonomy, and gradually move towards a hesitant, equivocal or ambivalent integration and stabilization. It appears that the adolescent is often found oscillating between a progressive developmental pull towards a more mature self and a regressive pull to depend on parental figures to remain a child (Meissner, 2009). Some of these features of adolescents have been well captured by Anna Freud (1958):

“I take it that it is normal for an adolescent to behave for a considerable length of time in an inconsistent and unpredictable manner; to fight his impulses and to accept them; to ward them off successfully and to be overrun by them; to love his parents and to hate them; to revolt against them and to be dependent on them; to be deeply ashamed to acknowledge his mother before others and, unexpectedly, to desire heart-to-heart talks with her; to thrive on imitation of and identification with others while searching unceasingly for his own identity; to be more idealistic, artistic, generous, and unselfish than he will ever be again, but also the opposite: self-centred, egoistic, calculating. Such fluctuations between extreme opposites would be deemed highly abnormal at any other time of life. At this time they may signify no more than that an adult structure of personality takes a long time to emerge, that the ego of the individual in question does not cease to experiment and is in no hurry to close down on possibilities.” (p.164-165)

Moreover, between the stages of object removal and attachment to a new object cathexis in adolescent development, middle adolescence appears to be a stage marked with some unique features. As the adolescent withdraws the libidinal attachment from the primary object, some mourning for the objects of the past is inevitable and so is some narcissistic withdrawal when no external object is cathected (Freud, 1958). In clinical situations, Anna Freud (1958) addressed the similarity between responses of adolescents and the two other kinds of mental upset in adults, namely unhappy love affairs and mourning, in terms of the libidinal position and the emotional struggles involved. A relatively similar view can also be found in Blos (1962) and later in Lewis (1989). Blos (1962) described middle adolescence “*in terms of two broad affective states: ‘mourning’ and ‘being in love.’ The adolescent incurs a real loss in the renunciation of his oedipal parents; and he experiences the inner emptiness, grief, and sadness which is part of all mourning*” (p.100). Moreover, Lewis (1987, 1989) applied Klein’s concepts of the two basic psychological organizations of the paranoid-schizoid and the depressive position (Klein, 1935) to early adolescence and middle adolescence respectively. Adolescent development is therefore characterized by the sequence of a



regression to the paranoid–schizoid position followed by a re-emergence of the depressive position in parallel with the process of object removal and shifts in adolescent's interpersonal activity (Lewis, 1989). Following the approach of the theorists mentioned, in summary, the stage of middle adolescence can be characterized by mourning for the lost infantile object, an immediate and urgent need for relatedness and encounters of limited relatedness marked by a sense of disappointment as the adolescent tends to treat any developing relationship as wish fulfilment.

### **3.2.2 Attachment Theory of Adolescent development**

In attachment theory of adolescent development, a great deal of emphasis has been placed on the transformation of attachment systems during adolescence. According to attachment theorists (e.g. Allen, 2008), children's primary attachment relationships continue to develop dramatically in adolescence and attachment styles differ significantly from previous stages (Furman & Simon, 2004; Furman, Simon, Shaffer, & Bouchey, 2002). The cognitive development of formal operational thinking allows the child to compare and contrast relationships with different attachment figures as well as with hypothetical ideals and construct a more realistic and integrated perspective on the positive and negative qualities of the current attachment relationships (Allen et al., 2003). At the representational level, consistent with the psychological mechanism shift from internalization and identification to integration in the psychoanalytic approach of adolescent development (Blatt & Blass, 1996; Erikson, 1968), attachment theorists advocate for the adolescent's capacity to think of attachment in a more general way, beyond any single relationship and the capacity to develop a single overarching attachment organization with stability and predictions for future intimate relationships within and beyond the family context (Hesse, 2008; Main et al., 1985; Sroufe & Waters, 1977; Thompson, 1997). Further illustrated by Allen and colleagues' study (2004) on attachment stability during adolescence and studies of attachment stability in adulthood (Benoit & Parker, 1994; Crowell et al., 2002), the internal organization of an individual's state of mind regarding attachment has stabilized substantially by middle adolescence (also see Ammaniti et al., 2000; Zimmermann & Becker-Stoll, 2002).

One of the central dynamics in adolescent attachment is the decreased reliance on

parents as attachment figures and adolescent's striving for autonomy and control during the developmental stage (Allen, 2008). As indicated by studies on affective quality of family relationships during adolescence, there is generally a decrease in closeness, an increase in conflict in early adolescence and an increase in emotional distance within the affective relationships (Buist, Deković, Meeus, & van Aken, 2002; Holmbeck, 1996; Steinberg & Morris, 2001). Different from the heavier emphasis on intrapsychic struggle in self-definition and relatedness during adolescent development in some of the psychoanalytic theories, attachment theory focuses on both intrapsychic and relational aspects of adolescent attachment stressing the significance of maintaining positive attachment relationships with primary caregivers in the current context (Allen et al., 2003; Ryan & Lynch, 1989). At first glance, adolescents striving for autonomy and independence may appear to be in conflict with the attachment system's set-goal of proximity that pulls the adolescent back to attachment figures especially in times of distress. However, considering the general biological function of attachment behaviours is to ensure a state of homeostasis between the child and the environment as well as an inner physiological equilibrium based on the psychological bond to the attachment figure (Bowlby, 1979/2005), such conflict between autonomy and attachment relatedness is somewhat similar to the interactions between the exploratory behavioural system and the fear system during early childhood (see Chapter 2, Section 2.2). In other words, a safe environment promotes an adolescent's ability to use the attachment figure as a secure base to explore with independence and autonomy (e.g. Allen et al., 2003), whereas the experiences of fear and stress triggered by perceived danger activates the attachment system to pull the adolescent back to the attachment figure for felt security (e.g. Fraley & Davis, 1997). With the principle that felt security is the set-goal (Sroufe & Waters, 1977), the attachment system operates in the same manner as in childhood with a different and rapidly changing balance between attachment and exploratory behaviours (Allen, 2008). Nevertheless, it is acknowledged that the push for autonomy in adolescence may be more "*relentless and more directly in competition with the attachment system*" than during infancy (Allen, Moore, & Kuperminc, 1997), especially as the exploration during adolescence concerns cognitive and emotional independence from the parents (Allen, Hauser, Bell, & O'Connor, 1994).

It can be argued that the key to resolving the developmental tension between autonomy and attachment during adolescence depends on the process of re-negotiation of the

child's role in the family, taking into account the adolescent's growing independence (also see Dubois-Comtois, Cyr, Pascuzzo, Lessard, & Poulin, 2013). This process involves both the adolescent's capacity to reconstruct the attachment relationships as they adjust to the cognitive, emotional and social changes and at the same time the parents' ability to adapt to a changing role of providing a secure basis according to the adolescent's current needs (Rosenblum & Lewis, 2003). In other words, both the developmental outcomes based on previous attachment experiences and the qualities of current attachment relationships are crucial to cope with the drastic adolescent transition. It was noted that a strong capacity to communicate across the increasingly divergent perspectives and needs of the parents and the adolescent, a willingness among both parties to allow the adolescent to seek autonomy while maintaining the positive parent-child relationship, and maternal attunement to the internal states of adolescents are closely associated with a secure state of mind in adolescence (Allen, 2008; Allen et al., 2003). In an interactive developmental way, attachment to parents can be viewed as a positive developmental process that facilitates development of autonomy in the context of an ongoing supportive relationship with parents (Ryan & Lynch, 1989).

Adolescents are required to develop a new balance between attachment relatedness to parents and the exploratory needs to be autonomous and independent. This balance between autonomy and attachment is considered a robust marker of the quality of an adolescent's internal state of mind regarding attachment (Allen, 2008; Allen et al., 2004) and the sense of a differentiated and consolidated self, as the concept of self is closely intertwined with working models of attachment figures (Bowlby, 1988/2005; Bretherton, 1985; Sroufe & Fleeson, 1986). The appropriate emotional distance from, and decreased dependence on, parental attachment figures in adolescence or the "epistemic space" (Main & Goldwyn, 1984) is critical and essential to allow adolescents to re-evaluate previous attachment experiences more objectively which may resolve attachment difficulties of the past and potentially alter the adolescent's state of mind regarding attachment, allowing for more secure attachment relationships with others in the future (Pearson, Cohn, Cowan, & Pape Cowan, 1994). Previously secure attachment experiences can lead to the adolescent's growing competence in autonomy and control, and in turn the development of competence decreases the need for dependence on parental attachment figures and promotes the need to explore and master new environments (Allen, 2008). Excessive dependency or premature detachment from

parents can lead to impairments in the ability to use attachment relationships as a constitutive interpersonal environment (Allen, 2008) and subsequently may disrupt the separation-individuation developmental process. As summarized by Sroufe and colleagues (2005) in their longitudinal study:

“The adolescent brings the process of self-development to a new level, developing the sense of being a unique, differentiated person, connected with the past and projecting into the future. ... More recently, however, it has been recognized that this new autonomy is not at the expense of continued closeness with parents (and now with others as well). The connection now is more between equals; adolescents recognize shortcomings of parents and their parenting. But individuation generally does not mean separateness. The individual now has greater responsibility for decisions, and to some degree, they must self-monitor. But parents retain the vital role of monitoring the teen's monitoring.” (p.68)

Furthermore, empirical studies have found that skills acquired from previous attachment experiences play important parts in the separation-individuation process during adolescence. For instance, the process of redefining a child's role in the family, taking into account the child's growing needs for independence and autonomy, is achieved by effective communication of emotional states and related thoughts within the attachment relationship (Bowlby, 1988/2005). Secure attachment in childhood allows the adolescent to communicate with parents more truthfully and fully about important topics, with more accurate emotional states and divergent disagreements (Allen et al., 2003; Becker-Stoll, Delius, & Scheitenberger, 2001; Cassidy, 2001) which promote attachment security and lead to the adolescent's growing competence in autonomy and control (Allen, 2008). As indicated in conflict situations, adolescents with secure attachment tend to show a balanced autonomy and positive relatedness with parents by engaging in productive problem-solving discussions (Allen & Hauser, 1996; Allen et al., 2004; Allen et al., 2003). Adolescents with dismissing attachment show minimum autonomy and relatedness in interactions with parents compared to other attachment groups (Becker-Stoll et al., 2001), suggesting that dismissing attachment may particularly hinder the process of renegotiation of parent-adolescent relationships (Allen, 2008). Preoccupied adolescents tend to unproductively over-engage with parents in arguments which ultimately undermines an adolescent's autonomy (Allen & Hauser, 1996).

As previously mentioned, the attachment security during adolescence is not only

influenced by the child's capacity to adapt to developmental changes, but also the parent's capacity to meet the adolescent's current attachment needs. As expected in the natural course of development, without the presence of apparent stressful life events, the gradual increase in maturity and experience in new relationships should promote increasing attachment security over time as adolescents' working models become increasingly coherent and integrated (Allen et al., 2004). However, in some circumstances, even previously securely attached adolescents and their parents may fail to adapt to the drastic changes during adolescence, which can further affect adolescents' current and future attachment relationships and social relationships (Allen, Hauser, O'Connor, & Bell, 2002). Not only this changing nature of attachment qualities is not only reflected in there being no significant continuities in attachment security from infancy to late adolescence in longitudinal studies (e.g. Weinfield et al., 2004). But also in some studies, current relationship qualities between adolescents and parents are found to be stronger predictors of attachment security in adolescence, compared to the weak concordance and no predictive power of maternal attachment security by middle to late adolescence (Allen et al., 2004; Allen et al., 2003). As has been well demonstrated by some other attachment studies, age differences (Cobb, 1996) were reported to be associated with deterioration in quality of attachment of children to their parents from early to later adolescence (Buist et al., 2002; Papini, Roggman, & Anderson, 1991; Paterson, Field, & Pryor, 1994). Thus, the secure base phenomena in adolescence requires the children and also the attachment figure to work in a goal-corrected partnership to maintain the attachment relationship ensuring the adolescent can explore with cognitive and emotional autonomy (Allen, 2008; Allen et al., 2003). As suggested by Allen and colleagues' cross-sectional study (2003) and longitudinal study (2004), adolescent security is closely linked to family interaction patterns in the current context (also see Allen & Hauser, 1996; Dozier & Kobak, 1992). According to their findings, during adolescence, several family relationship qualities such as enmeshed, over-personalizing interaction patterns between the adolescents and mothers were identified to predict declined levels of security even taking into account the initial levels of security. In a broader context, just as external parental support may buffer the effects of intrapsychic or psychosocial negative stressors (e.g. depressive symptoms, poverty) that challenge the adolescents' attachment system, stressors that overwhelm the adolescents' capacity for affect regulation and that are not managed by parents could significantly predict an increase in attachment insecurity (Allen et al., 2004). As

discussed in Chapter 2, Bowlby's notion of adaptation is always the joint product of developmental history and current circumstances (Sroufe et al., 1999). For adolescents in particular, the influence of the current situation is no less significant than the developmental history, for the reason that as they gradually start to construct a more general and integrated mental state towards attachment experiences, any effects of maternal attachment security are more likely to be mediated through family interaction patterns rather than have a direct impact on their state of mind (Allen et al., 2004).

Another important feature of adolescent attachment is the expansion of the attachment network, transferring dependencies from primary parental attachments to peer relationships and young romantic love, which is, in part, consistent with the psychoanalytic theory of finding a new cathecting object outside the family (Freud, 1905). Although the primary attachment relationship may still remain important even into adulthood, adolescents begin to have diverse attachment relationships beyond parent-child attachment relationships (Furman et al., 2002), and more importantly peer relationships and later romantic love gradually start to move up the attachment hierarchy (Fraley & Davis, 1997). By middle adolescence, peer relationships have started to take on many functions, some of which cannot be fulfilled by the primary attachment relationship. Interactions with peers provide important sources of intimacy, feedback about social behaviours, social information and influences, and potentially peer relationships may develop as lifelong partnerships and romantic love (Ainsworth, 1989; Collins & Laursen, 2000). By late adolescence, long-term relationships such as romantic partners and close friends can potentially serve as attachment figures (Allen, 2008; Furman et al., 2002). Some studies have already demonstrated how adolescents can use the expanded network of multiple attachments to enhance their felt security. For instance, Markiewicz and colleagues (2006) used a self-report measure to examine the use of parents, romantic partners and peers to fulfil attachment functions in a sample of adolescents and young adults in three different age groups (12-15 years, 16-19 years and 20-28 years). The attachment functions included proximity-seeking, safe haven and secure base. It was found that the use of attachment figures varied with age as well as the served attachment functions. In particular, adolescents tend to rely on their mothers to satisfy their exploration needs, while turning to friends in stressful situations, and using romantic partners to seek comfort.

Both psychoanalytic and attachment theory of adolescent development have highlighted the tension in the separation-individuation process with varying degrees of emphasis on issues of self-definition and interpersonal relatedness. To sum up, from the two-polarities perspective of personality development, Erikson's (1959) epigenetic psychosocial model has provided a comprehensive view of how the issues of interpersonal relatedness and of self-definition start to integrate at the adolescent stage (Chapter 1). With the advent of formal operational thoughts in early adolescence, the child develops a growing mental capacity for abstract, logical thinking, deductive reasoning as well as systematic planning and problem solving (Inhelder & Piaget, 1958). The advanced cognitive development allows the child to appreciate the different perspectives of others distinguished from his or her own, as well as more complex and abstract psychological properties such as values and principles which all contribute to the construction of self-identity (Blatt, 1995; Blatt & Blass, 1990). As Erikson (1968) noted, the formation of self-identity involves "*selective repudiation and mutual assimilation of childhood identifications*" from all previous developmental stages and integration with anticipation of the future (p.159). In other words, adolescence is a turning point from childhood to adulthood, which reconciles previously internalized experiences of self and others and the expected role in the wider context of a diverse society in the future. The successful resolution of the psychosocial crisis posed by the adolescent stage can lead to a consolidated and differentiated self-identity with the potential ability to live by society's standards and expectations (i.e. fidelity), whereas failure to do so may lead to role diffusion (Erikson, 1968; see Blatt & Blass, 1990). Although self-identity sits in the line of self-definition (see Chapter 1, *Figure 1.2*), the critical psychological mechanism is marked by the synthesis of mature and integrated expressions of individuality and relatedness in which the previously developed capacity to *trust* as well as to *cooperate* in the interpersonal dimension and the appreciation of *autonomy*, *initiative* and *industry* on the line of self-development, merge into a single continuum (Erikson, 1968). As Blatt (1995) described it:

"Self-identity, although partly a stage in the development of self-definition, is also a cumulative, integrative stage in which the capacity to cooperate and share with others is coordinated with a sense of individuality that has emerged from the development of autonomy, initiative, and industry - the capacity for sustained goal-directed, task-oriented, activity. Self-identity involves a synthesis and integration of individuality and relatedness - the internality and intentionality that develops as part of autonomy, initiative, and industry as well as the capacity and desire to participate in a social group with an appreciation of what

one has to contribute to, and gain from, participating in the collective, without losing ones individuality within the collective or the relationship.”

In short, adolescence is a critical period for integration in which maintaining a balance between self-definition and interpersonal relatedness is essential for adaptive development. Various factors can influence an adolescent’s adjustment to the developmental process such as components of previously internalized experiences of interpersonal relationships and of self and the development outcome, parents’ mental capacity to adapt to the child’s drastic developmental changes and the quality of their current relationships with the parents. Successful transition of the separation-individuation process involves coping with ego and superego restructuring, separating from parental figures both internally and externally to achieve autonomy and independence, while maintaining positive relatedness with parents and extending social relationships with peers and potentially romantic partners, and to furthermore develop a sense of self value and entitlement to social and cultural recognition and acceptance. In a way, mature personality development centres on the emergence of self-identity during adolescence integrating earlier developmental levels of self-definition and relatedness, and as it is gradually stabilized and consolidated, the initial self-identity continues to incorporate relational and social influences evolving as a self-in-relation and a self-in-society (see Blatt, 2008; Meissner, 2009; Sampson, 1988; Surrey, 1985).

### **3.3 The Development of Adolescent Twins**

Unlike any other sibling relationships, twins relationships are unique as their relationship with each other starts as early as their relationship with the mother. Twins’ genetic similarities, some shared experiences and the special bond between them, in a way, have already predetermined their special experiences throughout personality development, especially in the case of identical twins. For twins reared together, the genetic identity and shared and non-shared environmental influences are key determinants used in behavioural-genetic studies to understand the similarities as well as the individual differences in behaviours and personality traits. In psychoanalytic literature, the psychic relatedness between twins is also considered a major factor



influencing twins' personality development (Cronin, 1933; Joseph, 1961; Joseph & Tabor, 1961; Orr, 1941; Ortmeier, 1970). In normal adolescent development, for any individual, adolescence is a challenging developmental period with complex interplays of inner frustration and external demands as well as issues of self-definition and relatedness. Like any other individual adolescent in normal development, a single twin also faces the developmental tasks of establishing a differentiated and consolidated self-identity as well as maintaining positive relatedness with primary attachment figures and extending relatedness with others beyond the family context. However, the separation-individuation process renders twins into an even more heightened state of vulnerability as they also face the additional task of separating from each other. The meaning twins have for each other and the shared experiences between them, regardless of whether they are identical or fraternal twins, are factors that can interfere with the process of separation and individuation. The term "twinning reaction" (Joseph & Tabor, 1961) is frequently used in psychoanalytic literature addressing some of these aspects of life experience inherent in being a twin. The "twinning reaction" or the "joint ego" (Orr, 1941) has a tremendous impact on the twin's establishment of a consolidated and individual self, as twins are often treated as a unit by others. The gratification twins offer each other, their use of each other in acting out conflicts and the fact they pass through various developmental stages simultaneously are all risk factors that may result in mutual inter-identification and diffuse ego boundaries (Dimitrovsky, 1989).

From the start, twins' early relationships with their mother have already had a significant impact on twins' later separation-individuation process in adolescence (Burlingham, 1963; Demarest & Winestine, 1955). The mother's prior life experiences and specific attitudes towards twin birth, whether of expected pleasure or unexpected burden, will all contribute to how she treats the twins and subsequently cause reactions in the children (Burlingham, 1946; also see Joseph, 1961). One major difficulty inherent in identical twins is their identical appearance. It is important for the mother to differentiate between identical twins so that she can communicate freely and mirror emotions back at the right child and gradually start to establish a unique affective tie to each of the twins. However, in reality, even mothers sometimes get confused by the resemblance of identical twins and fail to identify with them, which can subsequently have repercussions in the personality structure of the children (Athanasios, 1986; Burlingham, 1946). Apart from the difficulties separating twins due to their physical

similarities, some mothers may be unwilling to separate the twins consciously or unconsciously. For instance, the extra attention the mother receives as well as the felt sense of accomplishment and importance may motivate her to increase twins' similarities and use them as objects for gaining her own narcissistic pleasure (Burlingham, 1946). Furthermore, as the mother has to attend to the needs of two infants at the same time, this may create enormous pressure on the role of the mother, especially a first time mother. As noted by Ainslie (1997), "*at the developmental juncture when the mother is uniquely important to her infant, the mother of twins is most likely to feel overwhelmed by the demanding task of meeting the needs of two infants at the same time*" (p.22). From a twin's perspectives, the other twin is always interposed between him or her and the mother, and this may create difficulties in establishing a good symbiotic object tie with the mother (Athanassiou, 1986). According to research studies and observational evidence, twins receive less individual attention from their mothers than non-twin children (Ainslie, 1997; Lytton, 1980), this may partly be due to twins' constant competition for their mother's attention (Burlingham, 1949).

As twins develop, issues of intensified rivalry or mutual interdependence and partial fusion may become increasingly salient in their personality development. Twins not only face the normal rivalry inherent in other non-twin siblings, but also the difficulties intrinsic in a twin relationship in that they often pass various developmental stages simultaneously (e.g. Arlow, 1960; Athanassiou, 1986; Burlingham, 1952; Leonard, 1961). Normal conflicts between siblings therefore are highly intensified between twins and consequently may lead to a variety of special solutions (Ablon, Harrison, Valenstein, & Gifford, 1986). For instance, mutual inter-identification is often used by twins in the oedipal rivalry as a means of resolving this particular intense rivalry (Burlingham, 1952). When one twin passes a developmental stage earlier than the other, conflict between twins can be heightened. In some circumstances, the more developed twin may perceive the twinship as a threat especially when developing self-identity, whereas the less developed twin who is still dependent on the twinship may also view the co-twin's individual development as a threat to their security and increase efforts to maintain the intensity of the object tie (Leonard, 1961). At other times, the more developed twin may inhibit the superior competence for the other more competitive twin to catch up, so as to maintain the balance between them (Ablon et al., 1986). Based

on these assumptions, it is not difficult to foresee that the development stage of separation and individuation during adolescence can be highly intensified and challenging as the process is not only directed at the tie of twinship but also such a process yields different meanings for each of the twins in the twin pair and as a twin unit.

In early years, twin may not appear to be interested in the presence of the other twin and the mother often remains the preferred object (Savic, 1980), even though the presence of the other twin may have a soothing effect (Leonard, 1961). However, especially for identical twins, as they grow and become more aware of each other and of mother's pleasure and other people's pleasure in them as a unit (see Burlingham, 1945), the amount of attention they attract from others is far greater than any single individual can get which may reinforce their narcissistic pleasure gains as a unit and thus their unity becomes difficult to give up (Burlingham, 1946). As noted by Joseph (1961), on twins' mutual dependence during the separation-individuation process, *"the twinship tends to oppose these developments [a sense of identity and self-image] by providing a ready means of fusion of object and self-representations with diffuseness of ego boundaries between them. The environment, especially the mother plays an important role but differences in drive endowment, apparatus, and threshold are at least as important."* (p.166).

In recent attachment studies, some theorists have addressed the nature of the twin relationship and its impact on twins' personality development (e.g. Fraley & Tancredy, 2012; Neyer, 2002a; Neyer, 2002b; Segal & Ream, 1998; Woodward, 1998). Based on the assumption of sibling and friendship attachment (Ainsworth, 1991; Fraley & Davis, 1997), Tancredy and Fraley (2006) applied the attachment theory to the twin relationship and proposed that twins were more likely to use the sibling as an attachment figure than non-twin siblings for their genetic relatedness, empathy, including the other in the self, and shared experiences (also see Hazan & Zeifman, 1994). The amount of time they spend with each other (Neyer, 2002b), the unique developmental circumstance of passing developmental stages simultaneously (e.g. Arlow, 1960; Athanassiou, 1986; Burlingham, 1952; Leonard, 1961), the significant proportion of shared experiences and mutual understanding (Burlingham, 1949; Koch, 1966) are all considered to be proximity factors that may promote twin's attachment

bonds. Moreover, according to the biological theory of kinship, people have a propensity to behave prosocially toward those who share their genes (Hamilton, 1964). Twins, especially identical twins, were thus argued to be more likely to use the sibling as an attachment figure compared to non-twin siblings because the shared genes facilitate the bond between them (Fraley & Tancredy, 2012; Hazan & Zeifman, 1994; Neyer, 2002b). In the further study of twin attachment in a national representative sample of the U.S. (age mean=43, SD=18, range 13-98), Fraley and Tancredy (2012) revealed that beyond adolescence, twins are not only more likely to use their siblings as attachment figures than non-twins, but also less likely than non-twins to use their parents as attachment figures. It should be noted that Fraley and Tancredy (2012) pointed out that even though co-twins are at the top of attachment hierarchies, twins do not differ from non-twins in using other important people as attachment figures such as friends and romantic partners. Furthermore, they (Fraley & Tancredy, 2012) have suggested on a biological basis that people are more likely to develop an attachment relationship with those with whom they share a larger proportion of genes and such an association may be due to the fact that shared genes may affect relational dynamics such as giving a heightened sense of empathy which subsequently promotes the development of attachment bonds.

In summary, the object relations theory emphasizing twins' tendency to mutual identification and joint ego development has focused on the challenges and risks involved in the separation-individuation process during adolescence. Some of these developmental difficulties are inherent in twinship as early as infancy, such as the mother's attitudes towards the twin birth, ability to treat each twin as a separate individual, the twins' competition for attention and rivalry for the maternal object's love. Furthermore, the narcissistic component invested in the co-twin, the featured regressive pulls in adolescence and twins' mutual interdependence, all make the object tie of twinship hard to give up during the separation-individuation process. As the consistently addressed problem of ego development of an individual twin is the establishment of a sense of self-identity, adolescence becomes a heightened conflict period for twins. In order to establish a differentiated and consolidated sense of self-identity, not only are they required to break off the tie to their mother as any other non-twin adolescent, but at the same time they need to loosen the object tie to the co-twin which is rooted as deeply as the tie to the maternal object in their personality structure.

However, based on the assumptions of twin attachment, with decreased reliance on parents as attachment figures, twins may become increasingly important for each other as attachment figures. They may be able to support each other as a secure base during adolescence and beyond, just as they can use each other as a transitional object when they are separated from the mother (Sandbank, 1999). Therefore, the attachment function twins may serve for each other can potentially facilitate the separation-individuation process. So far, although more in depth, the psychoanalytic theory of twin development has mainly stressed problems and difficulties for twins during the separation-individuation process in adolescence, as much of the theoretical formulation arises from analytic material of psychopathology. In attachment theory and research, a significant body of research on twins has focused on the use of twins for behavioural-genetic studies investigating individual variances in attachment due to genes and environmental influences. The twinship impact has often been neglected or minimized by controlling surrounding variables. Only very limited attempts have been made in attachment research to understand the nature of twin relationships. Based on current evidence from both psychoanalytic and attachment perspectives, it is still difficult to foretell how and in what circumstances, the functions of twin relationships can facilitate or hinder the separation-individuation process in personality development during adolescence. Considering the uniqueness of twinship, research studies on twins should not only consider the genetic identity and the environmental influences applicable to non-twin individuals in twin's personality development, but also be aware of the potential influences of twinship such as some life experience inherent in being a twin or the "twinning reactions" (Joseph, 1961). Nevertheless, attachment studies on twins especially on well-adjusted twins including behavioural-genetic studies and attachment studies on twin attachment can potentially uncover factors that facilitate individual twin's successful separation and individuation, which in turn can contribute to analytic treatment of the common pathology of identity fusion in twins.

### **3.4 Externalizing and Internalizing Disorders in Adolescence**

#### **3.4.1 The Two Polarities Model in Adolescent Emotional and Behavioural Problems**

As discussed, adolescence is a crucial period for integration and formation of self-identity, conversely, it can also lead to emergence or consolidation of many forms of psychopathology, especially personality disorders that are characterized by failures to integrate the two developmental processes of self-definition and interpersonal relatedness (Blatt & Luyten, 2009). Consequences of failure to adapt to the second separation-individuation process have been linked to various psychological disturbances ranging from borderline and narcissistic personality, family and marital dysfunction, suicidal ideation, and college adjustment (Freud, 1958; Pine, 1979). However, maladaptation in the individuation process such as failures of autonomy may not show any effects until young adulthood (Fabricius, 1998). A majority of current empirical research studies on developmental psychopathology in adolescence have been broadly organized into clusters of internalizing and externalizing disorders based on the characteristics of the symptoms (Achenbach, 1991; Hyman, 2011; Krueger & South, 2009; Lahey et al., 2008). The internalizing disorders include mood and anxiety disorders such as depression, anxiety and somatization. The externalizing disorders include conduct disorder, oppositional defiant disorder, antisocial personality disorder, substance use disorders and, in many studies, attention deficit hyperactivity disorder (see Hyman, 2011). In adolescence, research studies have indicated an increase of the prevalence of both internalizing and externalizing disorders (e.g. Moffitt, 1993; Roberts, Andrews, Lewinsohn, & Hops, 1990) and emerged gender differences in internalizing and externalizing disorders around early adolescence (Cohen et al., 1993; Fleming & Offord, 1990). Numerous studies have documented that girls are more likely to report internalizing problems, whereas boys tend to have higher rates of externalizing problems (e.g. Besser & Blatt, 2007; Cohen et al., 1993; Fleming & Offord, 1990; Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993; Whitley & Gridley, 1993).

The articulation of the two primary configurations – introjective and anaclitic psychopathology – has provided a valuable insight into some of the motivational factors in externalizing and internalizing problems in adolescence (Blatt & Luyten, 2009).

Since depressive symptoms tend to correlate significantly with both internalizing and

externalizing disorders in community-based adolescents (e.g. Krueger, Markon, Patrick, Benning, & Kramer, 2007; Lahey et al., 2008), studies based on the two polarities model have identified that vulnerability to introjective and anaclitic dysphoria can be used to understand different expressions of the externalizing and internalizing problems in adolescence to a great extent. For instance, the study conducted by Blatt and colleagues (1993) used the Achenbach Youth Self-Report Inventory (Achenbach, 1991), the Adolescent Depressive Experiences Questionnaire (Blatt, Schaffer, et al., 1992), and the Community Epidemiological Survey of Depression for Children on a sample of adolescents to examine the link between different expressions of dysphoria and internalizing/externalizing disorders. It was found that anaclitic dysphoria could significantly predict internalizing disorders, and introjective dysphoria significantly accounted for additional variance in predicting both internalizing and externalizing disorders (Blatt, 1991b; Blatt et al., 1993), even after removing depressive symptoms (Blatt et al., 1993). Another similar study stressing gender differences in anaclitic and introjective vulnerability and important interactive factors, has further documented that the greater stability in girls' anaclitic vulnerability can partly explain their increasing internalizing problems in adolescence, and boy's greater stability of introjective vulnerability can partially explain their increased risk for externalizing problems (Leadbeater, Kuperminc, Blatt, & Hertzog, 1999; also see review Leadbeater, Blatt & Quinlan, 1995). The causal links drawn between specific types of dysphoria and disruptive behaviours in these studies have not only explained the high comorbidity between depression and internalizing and externalizing problems to some degree, but also suggested that different forms and expressions of disruptive behaviours can in a way be understood by their underlying motivations associated with a specific type of dysphoric experience. Individuals with high levels of concern about abandonment or loss may tend not to engage in externalizing behaviours that could alienate others, whereas individuals with high levels of self-critical concern are more likely to get involved in disruptive behaviours inviting criticism and punishment, consciously or unconsciously (Blatt & Luyten, 2009).

Furthermore, Shahar and colleagues (2004) proposed an interactive-synergetic approach in which the interaction of anaclitic and introjective vulnerability are moderated by resilience factors of self-efficacy and gender in predicting changes in internalizing and externalizing symptoms in early adolescence. In order to illustrate the interactive-

synergetic approach, they analyzed data from 449 adolescent participants aged from 11 to 14, focusing on dependency, self-criticism and efficacy, the three factors of the adolescent version of the Depressive Experiences Questionnaire (Blatt, Schaffer, et al., 1992). These factors were further compared in relation to variables of participant gender, the Beck Depression Inventory (Beck, Steer, & Carbin, 1988) and the Youth Self-Report Inventory (Achenbach, 1991). The study found that the anaclitic factor of dependency and the introjective factor of self-criticism interacted only under low self-efficacy in predicting changes of depressive symptoms and internalizing symptoms, and changes in externalizing and internalizing symptoms among boys (Shahar et al., 2004). This interactive approach, consistent with Blatt's theoretical approach of synergistic dialectic transactions of relatedness and self-definition in personality development, has illustrated that difficulties occurring in one dimension are more likely to affect the other as synergistic vulnerability due to the developmental integration process of the two polarities in adolescence. Another important finding in the study is the effect of resilient factors on the interactions of anaclitic and introjective vulnerability in symptom development. The moderator self-efficacy was not only found to buffer interactive vulnerability, but also predicted a decrease in externalizing problems under low self-criticism (Shahar et al., 2004). In other words, the study findings imply that resilient factors in personality development may well protect against the development of depression and various disruptive behavioural problems in adolescence, just as attachment security can be regarded as a protective factor against psychopathology and significantly predict adaptive functioning in personality development (Cummings, Schermerhorn, Davies, Goeke - Morey, & Cummings, 2006; Fonagy & Target, 1997; also see Chapter 2 section 2.2.2). Although more research remains to be done in order to fully clarify the interactive mechanisms of protective factors and risk factors involved in adaptive and maladaptive personality development, these studies based on the two polarities model at this stage can provide a basis for early identification of adolescents at risk and for the development of effective prevention and intervention strategies (Blatt & Luyten, 2009).



### **3.4.2 Prior Research on Mental Representations and Mental Health in Adolescence**

Current and prior research into mental representations in adolescence, especially attachment studies, have largely focused on the exploration of adolescents' mental representations of relationships with parents and the link between the quality of the relational schemas (i.e. IWMs) and adaptive or maladaptive functioning (e.g. Allen, Moore, Kuperminc, & Bell, 1998; van Ijzendoorn & Bakermans-Kranenburg, 1996 also see review Allen, 2008). Furthermore, some research evidence has linked different patterns of attachment organization with adolescent's mental health. Adolescents with Preoccupied attachment are found to be more likely to associate with internalizing problems especially when experiencing a passive or enmeshed environment, such as depression, anxiety disorders or experiences of internal stress during transitions (e.g. Bernier, Larose, & Whipple, 2005; Rosenstein & Horowitz, 1996). However, in circumstances of a less responsive social environment, they might turn to externalizing behaviour problems (see Allen, 2008). Adolescents with dismissing attachment were more likely to be associated with externalizing problems (e.g. Rosenstein & Horowitz, 1996) and engage in relatively more severe forms of disruptive behaviours (Allen, Marsh, et al., 2002; Allen, Porter, McFarland, McElhaney, & Marsh, 2007). Among the categories of insecure attachment, not surprisingly, adolescents with disorganized attachment or unresolved status regarding trauma are found to have a higher prevalence of psychological disturbances and are more likely to be linked with more severe forms of psychopathology (Allen, Hauser, & Borman-Spurrell, 1996; Wallis & Steele, 2001). Relatively consistently, some longitudinal studies have reported that ambivalent attachment (Preoccupied) in infancy is more likely to be linked to anxiety disorder in adolescence (e.g. Warren et al., 1997), and avoidant and disorganized attachment at an early age can overall predict more severe forms of psychopathology such as dissociative symptoms in late adolescence (Ogawa et al., 1997).

These attachment studies have mostly addressed the centrality of the adolescent's mental representations of parents or the quality of current attachment relationships in relation to symptoms or level of psychological adjustment. However, little empirical work has been done on children's mental representations of self in adolescence, despite extensive emphasis on self in the literature and its pivotal position in understanding personality development and subjective experiences of patients in adulthood (e.g. Auerbach & Blatt, 1996; Bers, Blatt, Sayward, & Johnston, 1993; Rangell, 1982;

Tuttman, 1988). The lack of research on self-representation in adolescence might be due to a lack of appropriate assessment measures or the assertion that measures evaluating a separate construct of self-representation from relational schemas are redundant or invalid prior to adulthood (see Chapter 2, Section 2.2.1). Nonetheless, some previous studies from a social-cognitive perspective have addressed mental representation of self in middle childhood and adolescence, and have found that positive self-representations were more likely to be associated with better adjustment and diminished symptomatology (e.g. King, Naylor, Segal, Evans, & Shain, 1993; Segal & Blatt, 1993). Considering the development of an integrated mind regarding both primary attachment figures around late adolescence and young adulthood (see Furman & Simon, 2004), the integration of past and present attachment experiences (Allen, 2008) and the expansion of adolescent's working models of diverse relationships (Furman et al., 2002), the assessment of representation of self might become increasingly important around middle adolescence, as the self-representation will not only reflect an increasingly differentiated and consolidated self-identity, but also a more general mental state of relatedness rather than relationship-specific representations.

As Besser and Blatt (2007) proposed, an essential element of establishing adequate identity formation in early adolescence involved successful identification with the same-sex parent. In their empirical study (2007), Besser and Blatt examined adolescents' levels of mental representations of mothers and of fathers respectively by comparing and contrasting the conceptual level (Blatt, Chevron, Quinlan, Schaffer, & Wein, 1988) of their description of their mothers and fathers. The conceptual levels were further examined in relation to the gender related process of identity formation in early adolescence, as well as externalizing and internalizing problems measured on the Youth Self-Report Inventory (Achenbach, 1991). It was found that boys with higher levels of representation of mother than father were more likely to have externalizing behavioural problems, and girls who had higher representational levels of father than mother were more likely to have internalizing problems. The results of Blatt and Besser's (2007) study indicate that a "primary involvement" with the representation of opposite-sex parent in early adolescence may indicate potential disruption in the process of identity formation and therefore is more likely to be associated with the emergence of behavioural and emotional problems. In other words, adolescents who have an imbalanced organizational structure of parental representations that are incongruent

with their gender are also more vulnerable to psychological and behavioural disturbances. The significance of this study is that it highlights the importance of identity formation in early adolescence and the consequence of failure to do so. However, as the representations of both parents in later adolescence are expected to be more balanced and integrated (Erikson, 1968) passing the stage of identification, future studies in middle or late adolescence may find it worth examining a more general representational structure that can reflect the established self-identity and the relational representation of both parents rather than representations of mother and father respectively.

### **3.4.3 Intergenerational Transmission of Depression in Adolescence**

Based on the two polarities model, some research studies have found intergenerational transmission of introjective and anaclitic vulnerabilities of depression in adolescence. A line of research into internalizing and externalizing problems in adolescence has been investigating the influences of different parenting behaviours including support, behavioural control and psychological control, among which psychological control was particularly distinguished from behavioural control both conceptually and empirically (e.g. Barber, Olsen, & Shagle, 1994; Galambos, Barker, & Almeida, 2003). According to the assessment measure of psychological control developed by Soenens, Vansteenkiste and Luyten (2010), the parenting style of psychological control can be conceptualized by two polarities of the driving force of parental concerns, namely dependency-oriented domain and achievement-oriented domain, based on the varying emphasis on the dimensions of relatedness and self-definition. As part of their study, the two different approaches of parental psychological control were examined in relation to parents' own perception of their rearing style and their parental features (i.e. separation anxiety and maladaptive perfectionism). The two parental psychological controls were further examined in relation to personality features of middle adolescents and depressive symptoms. It was found that dependency-oriented and achievement oriented psychological control were associated with parental anxiety and perfectionism respectively. The two types of psychological control were differentiated and related to adolescent's personality features of dependency and self-criticism and such personality features acted as specific intervening variables between expressions of psychological

control and depressive symptoms. In other words, the study showed that the differentiation between these two domains of psychological control in parenting behaviours, in part, reveals the psychological processes in disrupted parental influences, the intergenerational transmission of anaclitic and introjective issues and the intergenerational transmission of certain symptomology (e.g. Ahmad & Soenens, 2010; Besser & Priel, 2005; Frost et al., 1991; Soenens et al., 2010).

Parents' personality functioning may determine different uses of psychological control, which subsequently affect adolescents' vulnerability to depressive symptoms (Soenens et al., 2005; Soenens et al., 2010). As illustrated in these studies, the parenting style of dependency-oriented psychological control and achievement-oriented control were found to relate to anaclitic and introjective vulnerabilities in adolescents respectively, which further related to increased vulnerability for differentiated anaclitic and introjective depressive symptoms in these adolescents (Soenens et al., 2010). To put it another way, the use of different psychological control in parenting mediates the relationship between anaclitic and introjective characteristics in parents and adolescents. Even more remarkably, the study conducted in 2005 by Soenens and colleagues found that the introjective characteristics could even be passed on to the third generation, manifested in these offsprings' introjective depression. In yet another outstanding study of intergenerational transmission of attachment insecurity in three generations of women (Besser & Priel, 2005), it was found that personality vulnerability of self-criticism mediated the association between attachment insecurity and depression symptoms within a generation. Depression mediates the link between insecure attachment in mothers and their daughters across generations. Based on the two polarities model, the significant intergenerational congruence of personality vulnerabilities and insecure attachment styles in that study has again highlighted the continuities of personality vulnerabilities and their impact on psychological disturbances across generations. However, despite of the significant evidence found on intergenerational transmission of anaclitic and introjective traits in depression studies, no research studies of the two polarities model have taken into account of the possible involvement of genetic mechanism in interpreting the transmission of personality vulnerability traits, attachment patterns as well as psychopathology across generations.

### **3.5 Overview and Aims of the Thesis**

Chapter 1 reviewed Blatt's two polarities model of self-definition and interpersonal relatedness in normal and disrupted personality development. Within this theoretical framework, a theoretical formulation as well as a range of operationalized assessment measures (see Chapter 4) were developed to assess different levels of mental representation of self and other. Despite of the significance of the model, some of the limitations were discussed in Chapter 1 Section 1.5. One of the major limitations is that Blatt's model primarily focuses on the development of psychopathology and the predominant use of subsequent measures in clinical populations. The normative range of the levels of mental representations provides baselines for understanding varying expressions of psychopathology as a result of deviations in normal personality development. However, no substantial empirical studies have been conducted to support the normative developmental levels of mental representations. Furthermore, the model of mental representation of self and other does not characterize individual variances in normative populations.

Chapter 2 reviewed attachment theory and research in light of the two polarities model. In contrast to Blatt's model, attachment theory and research focus on understanding early experiences of mother-infant relationships and their life-long implications for personality development in natural development. Different attachment measures derived are able to differentiate individual differences in patterns of internal working models within normative populations across different age groups. However, as reviewed in Chapter Section 2.3, predominate attachment classifications are rather broad and static and therefore difficult to establish strong link between insecure attachment representations and psychopathology (Dozier et al., 2008). Furthermore, attachment theory and research emphasize the quality of attachment representations in which intricate developmental differences within each of the attachment representational structures are not acknowledged. Therefore, by bridging between the two theoretical approaches of Blatt's model of mental representation of self and other and attachment theory as well as intertwining between measures derived from these two approaches, one of the aims of thesis is to compare and contrast measures of mental representation in the same sample in order to provide a fuller understanding of adolescent development.

Chapter 3 reviewed adolescent development from object relations perspective and attachment theory perspective. It is highlighted that adolescence is a critical developmental stage in which mental representation of self and other or internal working models are working through rapid transformations and becoming more integrated and stable representational structure. In particular, self-representation is argued to be increasingly important beyond mid-adolescence, as it reflects an increasingly differentiated and consolidated self-identity in a wider context as well as a more general mental state of relatedness rather than relationship-specific representations.

As reviewed in Chapter 1 and Chapter 2, one primary assumption shared both by Blatt's mental representational model and attachment theory is the primary emphasis on early environmental influences on personality development. Both approaches contend the mental representation or internal working models initially emerge from early mother-infant relationships and such internal organizations serve as templates for processing, organizing and guiding individual's subsequent experiences of self and interpersonal relationships. However, based on the predominant emphasis of early environmental experiences, subsequent research studies have similarly overlooked the potential influences of genes on mental representation or internal working models during the developmental process. Combining the previous findings of intergenerational transmissions of two polarities personality traits (Chapter 3 Section 3.4.3) and some of the genetic indications found in behavioural genetics studies in attachment research and personality research (Chapter 1 Section 1.4.2), the primary aim of this thesis is to examine whether there is any genetic influences on mental representations of self and other at the critical development stage of adolescent. It was hypothesized that there were significant proportions of the variance in mental representations was attributable to genetic factors in adolescence.

Therefore, this thesis used a sample of 160 pairs of adolescent twins reared together in attempt to investigate the degrees of genetic and environmental influences on mental representations of self and other in adolescence. Twins' levels of mental representations of self and other were assessed by the adapted Differentiation-Relatedness Scale on sections of the Child Attachment Interview. Therefore, prior to the behavioural-genetic study of mental representations of self and other, reliability and validity of the CAI-DRS measure were examined. The second aim of this thesis was to examine the developmental levels of mental representation of self and other in relations to

attachment security as well as psychopathology, and further to explore whether mental representation of self and other might serve as a mediator to bridge the gap between attachment and psychopathology, especially because the development of self-representation becomes increasingly crucial beyond childhood.

In sum, the aims of the thesis were:

- 1) To establish reliability and validity of the newly adapted Differentiation-Relatedness scale on semi-structured Child Attachment interview (i.e. CAI-DRS);
- 2) To test the genetic as well shared and non-shared environmental influences on mental representation of self and other;
- 3) To examine the levels of differentiation-relatedness of self and other among different attachment patterns;
- 4) To investigate the relationship between mental representational levels and psychopathology in adolescence.

## **PART II MEASURE ADAPTATION**



## **Chapter 4 Development of the CAI-DRS and Methodology**

### **4.1 Introduction**

Within the framework of the two polarities model of personality development, Blatt and his colleagues (Blatt, 1974; Blatt & Lerner, 1983a, 1983b; Blatt et al., 1975) formulated an integrative theoretical approach articulating the development process of mental representations of self and other (see Chapter 1, Section 1.2.1). The cognitive and affective components of mental representations of self and others evolve from a primitive level and become gradually more articulated and complex. Accordingly, the developmental levels of mental representations of self and others can range from global, diffuse, fragmentary and inflexible to increasingly differentiated, flexible and integrated. Based on early research into mental representations using projective assessment methods such as Rorschach, the Early Memories Test and the Object Representation Scale for Dreams (e.g. Blatt, Brenneis, et al., 1976; Hatcher & Krohn, 1980; Mayman & Faris, 1960; Ryan & Bell, 1984; Urist, 1977; Westen, 1991b), the operationalized and systematic measure of the Differentiation-Relatedness Scale (DRS) was developed by Blatt and his colleagues to assess the content and structural dimensions of object representation on spontaneous descriptions of self and significant others (Diamond, Blatt, Stayner, & Kaslow, 1993/2012).

The original DRS is most frequently used with the Object Relation Inventory (ORI; Blatt, Chevron, et al., 1988; Blatt, Wein, Chevron, & Quinlan, 1979) to evaluate open-ended, spontaneous descriptions of self and significant others. Although, the DRS is well validated in clinical and non-clinical adult populations across a number of empirical studies (see Section 4.2.2), it has not yet been adapted for use with children. The most frequently used assessment measure of object representations for children is the Conceptual Level scale (CL; Blatt, Chevron, et al., 1988; Blatt et al., 1979) in the children's version of the ORI (CORI; Waniel, Besser, & Priel, 2006). The CL scale aims to evaluate the cognitive development or conceptual level of descriptions, and has been used extensively in prior research with adolescents as well as adults. However, the scale primarily assesses parental descriptions, and previous research has focused on the associations between dimensions of parental descriptions and various indices for psychopathology (Besser & Blatt, 2007; Blatt et al., 1979; Bornstein & O'Neil, 1992;

Levy et al., 1998), as well as changes of representations during the course of long-term psychodynamic treatment in seriously disturbed late adolescent and adult inpatients (e.g. Blatt, Stayner, Auerbach, & Behrends, 1996; Blatt, Wiseman, Prince-Gibson, & Gatt, 1991). Considering the pivotal position of the concept of self in understanding personality development and psychopathology, and the emergence of self-identity in adolescence (Allen, 2008; Blos, 1979; Erikson, 1968), it is crucial and necessary to develop a measure that is able to assess a more generalized mental representation of self and others besides the specific mental representations of parents (see also Chapter 2, Section 2.2.1 and Chapter 3, Section 3.2). One of the ways to bridge the measurement gap is to apply the DRS in a more structured interview that is appropriate for adolescents. The newly adapted measure will be able to assess not only the mental representation of each parent but also the mental representation of self.

In order to use the DRS measure in more structured interviews, as well as to be more age appropriate, some changes and adaptations were made to develop a new version of the DRS, the CAI-DRS. The new measure is intended to be used as an adjunct to the Differentiation-Relatedness Scale (Diamond et al., 1993/2012), and is adapted for assessing the level of differentiation, integration and relatedness of self and others in the more structured and specific narratives of the Child Attachment Interview (Shmueli-Goetz et al., 2004). In addition, the scale can also be used for narratives gathered by similar instruments that assess representations of self and significant others, such as the permit question in the Parent Development Interview (Aber, Slade, Berger, Bresgi, & Kaplan, 1985; Slade, Aber, Berger, Bresgi, & Kaplan, 2003) where the participant is asked to use three to five adjectives to describe the relationship with his or her child, and possibly applicable to certain sections of the Adult Attachment Interview (George et al., 1996). This chapter will review the theoretical development of the original Differentiation-Relatedness in the Object Relation Inventory, its reliability and validity in various empirical studies and subsequently present the newly adapted version, the Differentiation-Relatedness Scale in the Child Attachment Interview.

## **4.2 Review of the DRS on the Object Relations Inventory**

### **4.2.1 the Development and the Structure of the ORI-DRS Measure**

During the last decades, extensive research on Rorschach and other projective techniques has contributed significantly to developing and operationalizing the clinical assessment of self and object representations (Blatt & Lerner, 1983b). Mayman and his colleagues evaluated the interpersonal aspects of the object representations in Rorschach response (Mayman, 1967; Urist, 1977), dreams (Hatcher & Krohn, 1980), and early memories (Mayman & Faris, 1960). They found these results corresponded to independent clinical judgements and to independent estimates of clinical progress in treatment of psychotic patients (Ryan & Bell, 1984). While Mayman and colleagues' findings established a valid basis to assess levels of object representations through thematic content, Blatt and his colleagues had worked on methodologies to assess the structural dimensions of self and object representations through the levels of differentiation, integration, articulation and affective components in response to Rorschach (Blatt, 1978). In a longitudinal study of a normative sample with an age range from 11 to 30 years, it was found that in Rorschach responses the descriptions of human figures increased significantly with age and became more accurate, articulated and richer with better integrated, reciprocal and benevolent interactions (Blatt, Brenneis, et al., 1976). In clinical studies, the methodology has shown that the developmental levels of realistic and unrealistic human representations in response to Rorschach discriminated among various diagnostic groups (e.g. Blatt et al., 1984; Blatt & Lerner, 1983b; Spear & Sugarman, 1984). Furthermore, the methodology was sensitive enough to capture the changes of object representations in responses to Rorschach and was used to evaluate patients' clinical progress over the course of treatment (e.g. Blatt & Ford, 1994; Blatt, Ford, et al., 1988a, 1988b; Blatt & Shahar, 2004).

The later development of the methodology to assess object representations in responses to Rorschach was the Rorschach Separation-Individuation Scale (Coonerty, Diamond, Kaslow, & Blatt, 1987), which incorporated concepts of separation-individuation (Mahler et al., 1975) and inter-subjectivity (Stern, 1985) into Coonerty's (1986) scale for evaluation of Rorschach responses. The new developmental levels of object constancy and interpersonal relatedness were added to Coonerty's original scale. In parallel, the Self-Other Differentiation Scale (Diamond, Blatt, & Kaslow, 1987) was

also developed to evaluate the level of separation-individuation and inter-subjectivity on the data obtained by open-ended descriptions of self and significant others gathered from the Object Relation Inventory (ORI; Blatt, Chevron, et al., 1988; Blatt et al., 1979). In a study assessing changes in object representations of four adolescent female inpatients with borderline personality disorder in long-term treatment (Diamond, Kaslow, Coonerty, & Blatt, 1990), both Rorschach and the ORI were administered. As the Rorschach Separation-Individuation Scale provided an index of primitive aspects of self and other representations, the Self-Other Differentiation Scale, elicited by verbally mediated descriptions of self and others in a more structured context, was more sensitive to interpersonal components of the representational world (Diamond et al., 1990). This Self-Other Differentiation Scale is the prototype of the current version of the Differentiation-Relatedness Scale (Diamond et al., 1993/2012).

Within the framework of Blatt's polarities model, the Differentiation-Relatedness Scale (Diamond et al., 1993/2012) incorporated developmental psychoanalytic theory (e.g. Jacobson, 1964; Kernberg, 1976; Mahler et al., 1975) and the cognitive developmental theory of Piaget and Werner (Piaget, 1926; Werner, 1948; Werner & Kaplan, 1963). The DRS characterizes the development of representation of self and other in two independent but interrelated simultaneously progressing developmental lines of self-definition and interpersonal relatedness, and as the representations of self and other evolve epigenetically, they become increasingly mature, cohesive and complex cognitive structures of self and other linked by affective valences (Behrends & Blatt, 1985; Blatt, 1974; Blatt & Blass, 1990; Blatt & Lerner, 1983a; Blatt et al., 1975; see Chapter 1). In short, the DRS outlines personality development in two interrelated polarities as striving towards a consolidated, integrated and individuated self-identity as well as increasingly mature, empathically attuned and reciprocal modes of interpersonal relatedness. The dialectic tension between the two developmental lines creates a fundamental dynamic that is central to the development of mature personality organization and healthy psychological functioning (Blatt, 1990; Blatt & Blass, 1992; Blatt & Levy, 2003; Blatt & Shichman, 1983).

**Table 4.1 The Differentiation-Relatedness Scale** (Diamond et al., 1993/2012)

Level	Level Description
1	Self-other boundary compromise
2	Self-other boundary confusion
3	Self-other mirroring
4	Self-other idealization or denigration
5	Semidifferentiation
6	Emergent, ambivalent constancy and cohesion and an emergent sense of relatedness
7	Consolidated, constant (stable) self and others in essentially unidirectional relationship
8	Cohesive, individuated, empathically related self and other in bidirectional relationships
9	Integrative, unfolding self and other in reciprocal relationships
10	Integrated, creative constructions of self and other in empathic, reciprocally attuned relationships with explicit recognition and appreciation of the intersubjective process of constructing meaning and the relational matrices that contribute to an evolving sense of self and other

The DRS consists of 10 developmental levels of differentiation and relatedness (see *Table 4.1* above). Each level has its unique defining features. Representations at the lower levels are considered an attempt, however maladaptive, to achieve some stability in representations of self and other, rather than static characteristics of individuals (Diamond et al., 1993/2012). At the lowest levels, the scale reflects the compromised boundaries of self and other in terms of bodily, cognitive or affective experiences (score 1 and 2). Representations in the middle levels reflect an unmodulated view of self or other as a mirrored extension of another (score 3), organized around a unitary idealization or denigration of self and other (score 4), or around a spilt of disparate aspects of self and other into polarized extremes (score 5). Representations at the higher levels of the scale reflect increasing differentiation and integration of disparate aspects of self and other and indicate a growing capacity to tolerate ambiguity and ambivalence (score 6 and above). At the highest levels, the scale reflects an appreciation of the complex, reciprocal interactions among past and present choices and an awareness of their consequences as well as an increasing sense of participation in complex relational matrices that co-determine perceptions, attributions, and the symbolizations of meaning

(Diamond et al., 1993/2012). Within these different levels, a clear indication is that a higher score of differentiation-relatedness indicates a greater degree of psychological health, as it reflects individual's increased articulation and consolidation of self-identity and interpersonal schema. In a way, various levels of differentiation-relatedness can also be regarded as "*clinically significant distinctions in the transition from grossly pathological to intact and even healthy object relations*" (Blatt & Levy, 2003; p.127).

#### **4.2.2 Reliability and Validity of the DRS**

The DRS has shown good inter-rater reliability in a number of different studies (Stayner, 1992, 1994; Vermote, 2005). In Stayner's (1992) study, five coders with different levels of clinical experience and familiarity with the development and psychodynamic conceptualization underlying the DRS rated 90 descriptions of ORI given by 7 inpatients at various times in the course of their long-term treatment at a private psychiatric hospital. Vermote (2005) examined the inter-rater reliability of the descriptions of 15 seriously disturbed inpatients with personality disorder (age  $M=35.4$ ,  $SD=11.33$ ) in Belgium. Both studies found a relatively similar inter-rater reliability result of .83 for the DRS global score using the intraclass correlation coefficient (Shrout & Fleiss, 1979). This coefficient result indicated that a considerable degree of agreement could be expected when the scale is used by a random sample of coders with similar training and experience as those in the reliability studies.

In terms of the concurrent validity, level 6 (Emergent Object Constancy) was found to be the threshold that discriminated psychiatric patients from normal controls (Luyten et al., 2006), as well as differentiating between secure and insecure attachment (Levy et al., 1998). It was also found that levels of differentiation-relatedness, especially the representation of self, significantly correlated with independent assessment of levels of clinical functioning in a seriously disturbed inpatient sample (Blatt, Stayner, et al., 1996). In other studies, the DRS was also reported to correlate with suicidal intent (Chance et al., 1996; Kaslow et al., 1998), and patients with suicide attempts were reported to have significantly lower levels of differentiation-relatedness compared to medical, non-psychiatric controls (Twomey, Kaslow, & Croft, 2000).

In terms of predictive validity, the changes of the DRS scores for representations of mother, father, therapist and self were found to have significant correlations with independent assessment of therapeutic change over the course of long-term treatment (Blatt, Stayner, et al., 1996; Philips, Wennberg, Werbart, & Schubert, 2006; Vermote et al., 2010). Changes of levels of differentiation-relatedness, especially in descriptions of therapist and self, were closely related and found to uniquely predict therapeutic change (Harpaz-Rotem & Blatt, 2005, 2009). In Blatt and colleagues' study (1996), it was reported that after intensive inpatient treatment, a sample of seriously disturbed, treatment-resistant patients improved from a mean level of differentiation-relatedness of a predominance of polarization and splitting (Level 5) to one of emergent ambivalent object constancy (Level 6). In their study, patients with the greatest degree of clinical improvement showed significantly higher DRS scores on therapist descriptions at admission. The result demonstrates the predictive value of the DRS on the therapeutic relationship and on the subsequent treatment outcome. Werbart and colleagues, in their studies of young adults receiving psychodynamic psychotherapy, reported similar findings (Philips et al., 2006). The discriminant validity of the DRS on ORI was demonstrated by studies conducted by Vermote (2005) and Stayner (1994). The significant associations between differentiation-relatedness levels and clinical functioning, and between DRS scores and degrees of clinical change were independent of intelligence, age or socio-demographic factors (Vermote, 2005) as well as clinical variables such as length of hospitalization and age of onset (Stayner, 1994).

In short, extensive research evidence has supported the inter-rater reliability and validity of the DRS measure on the ORI. The validity of the DRS has been primarily demonstrated by studies showing that the DRS is able to differentiate psychiatric patients from normal controls, and the sensitivity of the DRS is able to measure clinically significant change in personality and interpersonal functioning as a result of psychotherapy.

## **4. 3 the Adaptation of DRS to Child Attachment Interviews**

### **4.3.1 Differences Between CAI and ORI**

The structure and organization of the differentiation-relatedness scale in the newly adapted manual adhere to the original version (Diamond et al., 1993/2012). Coders can be reliable in this system without first becoming reliable in the ORI version. The new manual is developed to assess levels of differentiation-relatedness on the basis of a child's response to the Child Attachment Interview (Shmueli-Goetz et al., 2004), which is different from the spontaneous open-ended descriptions of the ORI. The CAI is a semi-structured interview protocol, in which children are invited to describe their relationships with their primary caregivers (suitable for children aged 7-12 years, recently extended to adolescent age of 16). The current version of CAI used for this study includes 19 questions with a warm-up question eliciting information relating to family composition at the beginning, followed by a series of questions tapping into the child's self-representation, representations of his or her primary caregivers, and times of conflict, distress, illness, hurt, separation, and loss. In order to score the CAI narrative on the DRS, only certain sections of the interviews are used for coding, mainly those sections that pinpoint the child's self-representation and representations of his or her primary caregivers, whereas times of conflict, distress, illness, hurt, separation and loss are not used.

In the CAI interview, description of self is followed by descriptions of relationships with primary caregivers (mostly mother and father) and the DRS scores of representation of self and representations of mother and father are coded continuously. ORI descriptions of self and significant others are often coded separately and coders are blind to the content of other narratives. The continuous coding on the CAI narratives may subsequently have some impact on the score judgement of DRS scores in each of the sections. Therefore, it is addressed in the CAI-DRS manual that coders should be aware of this particular issue and try to assign DRS scores separately for each of the description sections. Within each section of the descriptions, one important feature of the CAI narrative structure is the three describing words followed by examples. Compared to the free-flow of ORI spontaneous narrative, the CAI is more structured with standard prompts of three descriptive words and supportive examples for each word. Hence, the content and structure of the CAI narrative is relatively more restricted



and the transition between each word may appear salient compared to ORI description. It is noted in the new coding manual that coders should treat the three-word description as a relatively coherent structure. The three-word limit is also taken into account, as the description given may not be exhaustive, which is important to keep in mind when differentiating the DRS coding of idealization and proper positive descriptions within selected words. The judgement weight therefore should be placed on the authenticity and consistency of a subsequent example in the CAI descriptions. It is also advantageous for CAI narratives to have concrete examples in the description, which provide a more accurate account of examining seemingly all-positive statements in descriptions. For instance, in the ORI description of an all positive quality of a significant other without sufficient elaboration, the description may be coded as level 4 self-other idealization depending on linguistic markers that display static, absolute, all-encompassing quality, lack of any reference to conditionality or any sense of qualification or modulation. However, it may become difficult to determine between a score of 4 of idealization and a score of 6 for a list of appropriate, role conventional characteristics (emergent object constancy) on some all-positive but somewhat more realistic statements when there is no clear indication of linguistic markers. Moreover, this may also be found in some of the CAI narratives, some adolescents use words such as “always”, “all the time”, “never”, “every time” as linguistic markers, as an exaggerated expression or a generalized tone, which could cause some confusion. Therefore, elicited concrete examples in the CAI will provide more sufficient evidence to score differentiation-relatedness rather than merely relying on certain linguistic expressions, especially when there is no clear indication of linguistic markers or when some linguistic markers of static extreme qualities of idealization appear to be an individual’s habit of verbal expression.

The contents of CAI descriptions also differ from those of ORI to some extent. In the self-description section of the CAI, the child is invited to describe his or her personality in three words with examples, compared with free description of self in the ORI. Therefore, it is unlikely to have descriptions of physical appearance, demographic features or past histories of self, which can be observed in the ORI narratives. Furthermore, in the sections of relationships with mother and father, the CAI questions are tapping into aspects of interpersonal relationship (e.g. “can you describe your relationship with dad/mum in three words?”), in comparison with the person-specific

questions in the ORI (e.g. “can you describe your mum/dad/therapist?”). It is argued here that relationship descriptions may better capture the developmental level of the individual’s representation of self and other on the basis of Kernberg’s view of important aspects of the individual’s personality structure. According to Kernberg (1976), representations derive from internalized relationships to primary caregivers and such internalized early interpersonal experiences consist of three parts: representation of self, representation of others, and the affective tone characteristic of these relationships between self and other. This view is supported by other object relations theorists (e.g. Loewald, 1962, 1978) and attachment theorists (e.g. Main et al., 1985; Sroufe & Fleeson, 1986), that it is relationships rather than the individual that are internalized in the development process. In other words, at least at the development stage of adolescence, it is important to explore the relational schemas within a relationship specific context consistent with an attachment approach that mental representations of self and of significant other represent obverse aspects of the same relationship and could not be understood in separate terms (see Chapter 2, Section 2.2). Thus, by directly asking about a child’s current relationships to primary caregivers, it may provide a fuller and more accurate view of the individual’s internalized relationships as well as the significant objects that include the self in relation. Another important difference between the CAI and the ORI is the probing of affective states within the CAI descriptions. In the ORI, descriptions of affective states grounded in the narrative are spontaneous and often serve as important markers to determine the functioning of differentiation-relatedness. In CAI, except for those affective descriptions grounded in elaborated examples, the participants are further prompted to elicit relevant affective states following the descriptions of examples. The affective statements therefore lack spontaneity and may warrant a lower differentiation-relatedness score. However, with adolescents, the prompting of affective states is considered an integral part of the narrative. If the following affective description captures an accurate account of the emotional states of self and other with empathically attuned reflection, a high score on the DRS is assigned even though the affective description may lack spontaneity.

#### 4.3.2. Structure of the CAI-DRS

The scoring system of CAI-DRS comprises 13 items in total and these can be divided into four sections that are consistent with the CAI narratives: *Self-description* section, where the child is invited to use three words/phrases to describe his or her personality, *Relationship with Mother* section and *Relationship with Father* section, where the child is prompted to use three words or phrases to describe his or her relationship with the mother and the father respectively, and an additional section of *Twin Relationship Description* where the child is asked some general questions regarding his or her relationship with his or her twin and similarities and differences regarding his or her twin's relationship with the parents. Each section of this coding system is comprised of two or three subscales and one Differentiation-Relatedness Scale (see Appendix). Although DRS is scored separately from other subscales, each of the subscales contributes in assisting coders to assign an overall DRS score for each section. The section of the twin relationship was specially added for the purpose of the attachment research project of the Twin Early Development Study, and the structure of the narrative is different from previous sections of self-description or relationships with parents. Therefore, the application of the DRS to the twin-co-twin section remains for further consideration in the testing process (see Chapter 5).

The outlines of the CAI-DRS items are summarized below in *Table 4.2*. In the self-description section, the first item, C1 Mode of Description, is designed to assess the predominant mode of description when describing self-personality traits. It is rated on a 5-point scale indicating five different categories ranging from descriptors that fail to portray overall personality qualities (including physical or demographic properties or overt behavioural features), descriptive mode of external personality traits, internal personality traits to mixed personality traits with an external emphasis or an internal emphasis. The second item, C2 Articulation of Self-Description, measures the articulation and specificity of self in the description regardless of the positive/negative qualities of self. The score depends on the extent to which an individual is able to provide a detailed description of a distinctive self. The primary concern is the coherence and complexity of the narrative. This item is a continuous 9-point scale with scores of odd numbers defined in the scoring manual. Even number scores are assigned when narrative articulation seems not yet to meet the criteria for a higher odd number score.

In addition, some of the indices although not exhaustive are listed in the manual for reference when coders need to consider a lower scale point (see Appendix the CAI-DRS manual). Item C3 in self-description is primarily concerned with how the individual views self in terms of self-critical or self-positive valence. A low score indicates a negative and self-critical way of viewing self, expressing self-hatred, harsh judgement or neglect of the self. A higher score reflects positive self-regard indicating a stable sense of self with feelings of confidence, strength or success. At a much higher level, the positive self is described in a benevolent, accepting, caring way expressing self-esteem. C2 articulation and C3 self-regard are partly based on the Assessment of Self measure (Blatt, Bers, & Schaffer, 1992) and incorporating the Social Cognition and Object Relations Scale-Global rating method (Hilsenroth, Stein, & Pinsker, 2007) on the Thematic Apperception Test response. As well as other subscales of each section, the aim of the subscales is to break down some of the specific elements of the Differentiation-Relatedness scale and help coders arrive at a better decision for assigning a global DRS score for each description section, especially as the narrative of the CAI is often more elaborate and with more specific details than the ORI.

**Table 4.2 Outline of the CAI-DRS**

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**Section 1 self-description**

C1. Mode of description (categorical 1-5)

1. Physical or demographic properties, overt behavioural features or other descriptors that fail to portray overall personality qualities.
2. All external personality traits.
3. All internal personality traits.
4. Mixed internal and external modes with a predominant external emphasis on personality traits.
5. Mixed modes with a predominant internal trend.

C2. Articulation of self-description (1-9)

1. In extreme cases, lack of descriptive words and no examples.
3. All three descriptive words are provided but accompanied descriptions may be simple, one dimensional and narrow.
5. The descriptive words given are simple or somewhat commonly used and the following examples are still vague in some of the details.
7. Particular quality and characteristic of self is specified within the three words and there are adequate elaborations of a distinctive self in different illustrative examples.
9. Descriptions of self are rich, complex and sometimes even creative.

C3. Self regard (1-9)

1. Self-loathing or global badness of self.

3. Some positive elements but overall still grossly malevolent.
  5. Neutral description of self.
  7. Description may have both positive and negative elements but overall have a more positive or hopeful tone.
  9. Sense of self is experienced as positive an enriching.
- C4. Differentiation-Relatedness Scale (1-10)

## **Section 2 Description of the Relationship with Mum**

- C5. Articulation of relationship (1-9)  
 C6. Quality of relationship (1-9)  
 C7. DRS (1-10)

## **Section 3 Description of the Relationship with Dad**

- C8. Articulation of relationship (1-9)  
 C9. Quality of relationship (1-9)  
 C10. DRS (1-10)

## **Section 4 Description of the Relationship with the other twin**

### C11. Reference to the other twin (1-9)

1. No mention or acknowledgment of the other twin throughout the narrative.
3. The other twin and their relationship are mentioned globally or in a non-specific way.
5. Appropriate reference.
7. Some uncontrollable elaborations of the other twin.
9. Constantly mentioning the other twin throughout the whole narrative without even being asked.

### C12. Quality of relationship (1-9)

### C13. DRS (1-10)

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Based on C2 and C3, C4 DRS is coded on the section of self-description. The 10-point Self-DRS score is modelled on the original DRS with modifications adapted for CAI narrative. Section 2 description of the relationship with mother, section 3 description of the relationship with father and section 4 twin relationship (except for item C11) have relatively the same coding system as C2, C3 and C4 in the self-description with modified descriptors for each of the coding scales. In the twin section, instead of articulation, C11 is concerned with the extent to which the other twin and their twin relationship are articulated through the whole narrative including sections of self-description, mother and father relationship descriptions and the description of the twin's relationship and co-twin's relationship with parents. The item evaluates the amount of

reference to the other twin in the whole narrative and in part reflects the mental representation of the twin relationship.

In summary, the DRS measure in ORI is based on an extensive and rich theoretical foundation with solid inter-rater reliability and validity across different studies. It is a well-established measure to assess individual's developmental levels of object representations of self and other. The CAI-DRS is adapted from the DRS in order to apply to the semi-structured Child Attachment Interview that is more appropriate for adolescents. The measure consists in total of 13 items for assessing developmental levels of object representations of self, mental representations of self and parental figures, and representations of the twin relationship. The list of items in the newly adapted measure aims to provide a fuller picture of the content, affective qualities and structure of adolescent twin's representational world. In addition, after validation of the CAI-DRS, the scale may also be extended to applications of the DRS with instruments that are similar to the CAI such as permit questions in the PDI and sections of the AAI.

#### **4.4 Overview of Methodology**

This thesis includes two major parts. The first part of the study aims to examine the reliability and validity of the newly adapted CAI-DRS measure. The second part of the study uses a classical twin design to examine the behavioural-genetic influences on mental representation of self and other in adolescence.

In Chapter 5, the reliability of the CAI-DRS is examined in terms of inter-rater reliability at two different training phases among different coders, along with the internal consistency of the measure. The inter-rater reliability test is to assess the degree to which different coders with varying levels of experience consistently agree with each other on items of the CAI-DRS. The internal consistency of the measure is estimated, to explore whether items of the CAI-DRS consistently reflect the same construct of mental representation of self and other and yield similar results. Chapter 6 examines the discriminant validity and concurrent validity of the CAI-DRS. Discriminant validity is a measure of whether the consistency observed in mental representation of self and other is because of actual consistency or whether it reflects other stable aspects of the

adolescent such as gender, ethnicity or socioeconomic status. In other words, the discriminant validity part of this study tests whether the levels of mental representation of self and other are independent of the participant's gender, ethnicity and socioeconomic status. The concurrent validity of the CAI-DRS in this study is examined in relation to measures of self-reported *Youth Symptom Inventory* and parent reported *Child Adolescent Symptom Inventory* (see Section 4.4.2 below). It aims to examine whether the levels of mental representation can distinguish between adolescents with reported clinical symptoms and those without. In Chapter 7, the convergent validity of the measure is reported in relation to the scales and attachment classifications of the *Child Attachment Interview* (Section 4.4.2). Both the Child Attachment Interview and the Differentiated-Relatedness Scale are developed to assess representation of self and other (see Chapters 1 and 2), however different aspects of mental representation are measured. Convergent validity determines the degree to which the adapted CAI-DRS measure is similar to the Child Attachment Interview measure. Chapter 8 presents a behavioural-genetic study of 160 twin pairs reared together (including equal numbers of monozygotic and dizygotic twins) examining the degree of genetic and environmental influences on mental representation of self and other in adolescence.

#### **4.4.1 Participants and Sampling Strategy**

The *Twin Early Development Study* (TEDS) is a longitudinal project based at the SGDP of King's College London. The purpose of the project is to examine how genes and environment shape individual's development from birth to young adulthood. The cohort of the study was taken from a pool of 16,810 twin pairs born between 1994 and 1996, in which the initial return was approximately 12,000 families. The sample sizes in recent cohorts varied between 6,900 and 5,900 twin pairs and remained reasonably representative of the UK population (CAI; Shmueli-Goetz et al., 2004; see Chapter 2 Section 2.2.1). In the sample, twin zygosity was diagnosed on the basis of physical similarity and questionable cases were verified with analysis of DNA markers (Kovas et al., 2007). One of the recent projects of the TEDS conducted between 2010 to 2012 at the Anna Freud Centre/UCL in collaboration with the Institute of Psychiatry's SGDP Centre was to investigate the behavioural genetics of attachment at adolescent age and the extent to which common genetic factors drive the link between attachment and

adolescent emotional or behavioural problems (Fearon et al., 2013). The TEDS families with twins of appropriate age that lived within the greater London area or in urban areas with good transport links to London were invited to take part in the attachment study. Of the 1,292 families, 694 initially agreed to participate, representing 54% of those approached. In total, 582 same-sex Dizygotic Twins (DZ) and Monozygotic Twins (MZ) with an average age of 15 years were assessed in the TEDS attachment project. The sample included 320 female twin pairs and 262 male twin pairs with a mean age of 15 at the assessment point (age range 13.9 to 16.4 years). Within the assessed family sample, 85% of the families were white with a median household income of £30,000 to £50,000, 65% of the families had both parents in full or part-time employment, 31% had completed secondary school and 34% were at degree level (Trouton, Spinath, & Plomin, 2002).

In the current study, the participants were 160 pairs of same-sex twins with a mean age of 15.00 (SD=.26, range 14.09-15.87) at the assessment time. The families mostly lived within the Greater London area or geographically close urban centres with good transport links to London. The sample of this study is part of the total 582 participating twin families from the TEDS project 2010/12. For the purpose of the study, the current sample was weighed by gender and zygosity. The 582 families in the TEDS were divided into 4 subsections balanced by gender and zygosity including male identical twins, female identical twins, male fraternal twins and female fraternal twins. In each of the sections, 40 families were selected using a randomized strategy in order to approximately match the demographic characteristics of the main study sample. The demographics of the sample in this study are summarized in Chapter 6, *Table 6.1* and *Table 6.2*.

#### **4.4.2 Measures**

##### ***The Interview protocol:***

The Child Attachment Interview (CAI) (Shumueli-Goetz et al., 2004) is a semi-structured interview developed on the basis of the Adult Attachment Interview (George et al., 1996), the Strange Situation Procedure (Ainsworth et al., 1978), and the division of narrative about relationships into relationship episodes (Luborsky & Crits-Christoph,



1998). The CAI protocol aims to elicit children's representations of attachment security to each of the parents and their overall state of mind regarding attachment in middle childhood (Shmueli-Goetz et al., 2004). The CAI is suitable for children aged 7-12 years old and it has been further extended and validated for children between 7-16 years old (for the CAI review see Shmueli-Goetz et al., 2008; Venta et al., 2014). Further review of attachment assessment measures including the CAI can be found in Chapter 2, Section 2.1. The protocol comprises 15 questions opening with a warm-up question about the child's family composition, followed by questions regarding the child's perception of his/her personality, the relationship with the primary caregivers and episodes of conflict, distress, illness, hurt, separation and loss (for the CAI protocol see the Appendix). The version used for the TEDS attachment project is the adapted adolescent version for age range 13-18 years, with an added section (for the purpose of the TEDS study) about the twin's relationship with the other twin and the perception of the co-twin's relationship with the primary caregivers. Overall, the current version comprises 19 questions in total with probes where appropriate to assist the adolescent to elicit relevant examples or episodic details. The majority of interviews took between 30 and 60 minutes to complete. All the interviews in the TEDS project were videotaped and transcribed verbatim. The sections used for coding CAI-DRS were the self-description, descriptions of relationships with primary caregivers and the description of the relationship with the other twin, whereas times of conflict, distress, illness, hurt, separation and loss in the CAIs were not coded. In the narrative, the structure of the self-description and descriptions of the relationships with the primary caregivers are the same, starting with three words and prompted for relevant examples. However, the twin section consists of more general questions including how they get on, whether they argue or support each other, whether they hang out together and how the co-twin's relationship with caregivers may differ from each other.

### ***Child Attachment Coding System***

The coding and classification system of the CAI is partly derived from the Adult Attachment Interview (Main & Goldwyn, 1994), but incorporating elements of behavioural coding based on videotapes and segmented narratives into relationship episodes (Luborsky & Crits-Christoph, 1998). The scale of the CAI includes both a

categorical system of attachment classifications (i.e. Dismissing, Secure, Preoccupied and Disorganized) and nine linear-continuous subscales of attachment-related dimensions that reflect the child's overall current state of mind with respect to attachment. The subscales are Emotional Openness, Balance of Positive and Negative, Use of Examples, Anger Preoccupation, Morbid/Anxious Preoccupation, Idealization, Dismissal, Conflict Resolution and an Overall Coherence score, and among these Anger Preoccupation, Morbid/Anxious Preoccupation, Idealization, and Dismissal are rated separately for the mother and the father. In particular, the three scales of Use of Examples, Balance of Positive/Negative qualities of the attachment figures, and most importantly the Overall Coherence were designed to capture the aspects of attachment narrative indicating the degree of realism and integration of the representations of the relationship with each parent. Each of the subscales were coded from 1 to 9 with the anchor points illustrated by examples in the CAI coding manual. In addition, a behavioural analysis of the child's responses during the interview is also carried out as an additional helpful indicator of attachment strategies, taking account of eye contact, changes in tone of voice, marked anxiety, changes of posture in relation to the interviewer as well as contradiction between verbal and non-verbal expression.

For both normally developing children and those referred for mental health treatment, the CAI measure has demonstrated with high inter-rater reliability, excellent test-retest reliability, and good concurrent and discriminant validity (Shmueli-Goetz et al., 2008; Venta et al., 2014; also see Chapter 2 Section 2.1).

#### ***Youth's Inventory-4 (YI-4)***

The Youth's Inventory-4 (YI-4; Gadow & Sprafkin, 1999b) is a standardized self-report rating scale designed to assess DSM-IV emotional and behavioural disorders in youths (American Psychiatric Association, 1994). The scale is based on a youth's perceptions of his or her problems and is suitable for adolescents between 12 and 18 years old. Items in the YI-4 are rated by frequency, 'never', 'sometimes', 'often', or 'very often', based on which, the scoring system derives Symptom Count Scores (diagnostic model) and Symptom Severity Scores (normative data model). The results of the symptom count scores correspond to symptom criterion scores necessary for a DSM-IV diagnosis and can be further translated into Symptom Cut-off scores. The severity scores (*T* scores)

indicate levels of low, moderate or high symptom severity according to the symptom profile in the YI-4 manual.

In total, the YI-4 version used in the study contains 128 items (see Appendix) grouped according to the symptom characteristics of 18 disorders referencing the DSM-IV. The disorders include: AD/HD, Oppositional Defiant Disorder, Conduct Disorder, Generalized Anxiety Disorder, Social Phobia, Separation Anxiety Disorder, Dysthymic Disorder, Bipolar Disorder, Schizophrenia, Motor Tics, Vocal Tics, Schizoid Personality Disorder, Somatization Disorder, Anorexia Nervosa, Bulimia and substance use. In previous research studies, YI-4 has shown good reliability and validity results (Gadow & Sprafkin, 1997, 1999b; Gadow et al., 2002). It was found in a sample of referred youths between 11 and 18 years old (N=239) that neither the IQ ( $r < .20$ ) nor the SES ( $r < .15$ ) was associated with the YI-4 scores (Gadow et al., 2002). Similarly, age and gender differences were minimal with the exceptions of substance use affected by age ( $r = .40$ ) and eating problems affected by gender. The symptom categories demonstrated satisfactory internal consistency ranging from .66 to .87 using Cronbach's alpha. The test-retest reliability ranged from .54 to .92. Furthermore, convergent and divergent validity were examined by comparing YI-4 to the *Youth Self Report* (Achenbach, 1991), the *Children's Depression Inventory* (Kovacs, 1992), and the *Multidimensional Anxiety Scale for Children* (March, 1997). Predictive validity was demonstrated in a study of a child and adolescent psychiatry outpatient clinic (Gadow & Sprafkin, 1997).

#### ***Child Adolescent Symptom Inventory-4R (CASI-4R)***

The Child Adolescent Symptom Inventory-4R (Gadow & Sprafkin, 2005) belongs to the same symptom inventory family (see Gadow & Sprafkin, 2012) as the YI-4. Unlike the self-report YI-4, the CASI-4R is an observant assessment measure for DSM-IV defined emotional and behavioural disorders. The scale combines all the items from the *Child Symptom Inventory-4* (Gadow & Sprafkin, 1999a) and the *Youth Inventory-4* (Gadow & Sprafkin, 1999b) with a wider age span of 5 to 18 years. In addition, the CASI-4R also includes a question about the degree of functional impairment for each symptom category, specifically how often the behaviours in the category interfere with the youth's social ability and academic performance.

The CASI-4R includes versions of the Parent Checklist and Teacher Checklist. The parent version contains 142 items in total and the teacher version contains 105 items. The format of the measure and the scoring procedure is relatively similar to the YI-4. The results obtained from the CASI-4R derive Symptom Count Scores, Symptom Severity Scores, Impairment Scores and Clinical Scores. There are separate scoring profiles for children aged 5 to 12 years and youths of 12 to 18 years. The Symptom Count scores correspond to symptom criterion scores necessary for DSM-IV diagnoses. Severity Scores are *T scores* based on a dimensional model generated from normative data. It should be noted that as a result of a lack of normative data, there are no *T scores* for youths of 12 to 18 years old for the symptom categories of Autistic Disorder or Asperger's Disorder. The impairment scores corresponding to the functional impairment questions are used additionally to the Screening Cut-off score aiming to derive the Clinical Cut-off score for each category. In other words, the impairment scores in each symptom category provide additional information about the perceived impact of symptoms of a particular disorder regardless of the Symptom Count score or Symptom Severity score. The Clinical Cut-off scores of the CASI-4R are a combination of the DSM-IV referenced symptom count scores and the impairment scores.

For the reason that CASI-4R is a combination of the CSI-4 and YI-4, the reliability and validity of the CASI-4R has been demonstrated by application of the two measures in various empirical studies (Gadow & Sprafkin, 1999a, 1999b; Sprafkin, Gadow, Salisbury, Schneider, & Loney, 2002). The studies have shown that the CSI-4 and YI-4 scores overall show a reasonable degree of predictive validity in relation to psychiatric diagnoses and good concurrent validity correlating with other commonly used dimensional scales (for an extensive review see Gadow & Sprafkin, 2012). Research studies also support the effectiveness of the CASI-4R as a screening instrument for a variety of child psychiatric disorders (e.g. Gadow, 2013). However, CASI scores can not be regarded as a substitute for clinical diagnosis as clinical assessment requires more extensive information on each individual in order to build a fuller clinical profile. It was noted by the authors that the CASI-4 only provides a guideline for screening children and adolescents for emotional and behavioural disorders.

In this study, the Parent Checklist of the CASI-4R was used along with the self-report YI-4. Although it is important to evaluate youth behavioural and emotional disorders in a school setting, this study has emphasized the observed expressions of emotional or behavioural difficulties at home. The information collected from parents was compared with the youth's self-report results, as a specific source may not provide an accurate description of the presence of the symptoms or the severity. In the TEDS study, the CASI-4R data were collected from both mothers and fathers of the adolescent participants. However, only the results reported by mothers were analyzed in this study due to the response rate. In the TEDS project, the response rate of the collected CASI-4R from mothers was 97.1% of the 582 families in comparison with 56.7% of fathers. The difficulties in obtaining the CASI-4R data from fathers might imply that mothers are generally more reliable sources for observing youths' emotional or behavioural problems in the family.

#### **4.4.3. Procedures**

##### ***Administration of the interviews:***

Within the SGDP TEDS data pool, the families with twins born between 1994 and 1996 were invited to the current TEDS project. Of the 1,292 families approached, approximately 54% of the families initially agreed to participate in the project and subsequently 582 families were assessed. The project was approved by the University of Reading Research Ethics Committee (see Appendix). Informed consent and a series of assessment questionnaires were posted to the families to complete prior to the interviews. On the assessment days, the participant families had the CAI interviews administered by two pre-trained interviewers either at one of the two research centres or at the family home. Twins were interviewed simultaneously in separate rooms by different interviewers. Both of the interviewers were blind to the content of the interview of the other twin. Most of the CAI interviews lasted about 30 to 60 minutes. All the interviews were videotaped and later transcribed verbatim.

### ***CAI Coding Procedure***

In the coding process, two reliable CAI coders (other than the interviewers) completed the coding independently. The coders were entirely blind to twins' zygosity and demographic information and had no knowledge of the content or coding of the other twin's CAI.

In the TEDS attachment project, a team of research assistants and two PhD students were trained to code the TEDS CAIs. All coders achieved 80% or higher agreement for attachment classifications from a standard reliability set. In the 59 interviews from the current sample, the inter-rater reliability for coherence was .72, and inter-rater agreement for classification was 85% and 86% for the secure-insecure two-way classifications with respect to mother and father ( $\kappa=.69$ , and  $.72$ ). Reliability for three-way classifications including Secure, Dismissing and Preoccupied was 80% and 83% for mother and father ( $\kappa=.69$ , and  $.72$ ) and 75% and 78% for four-way classifications, adding Disorganized ( $\kappa=.62$  and  $.67$ ). Further information can be viewed in the TEDS attachment study (Fearon et al., 2013).

### ***Coding Procedure of the CAI-DRS***

For the CAI-DRS coding, 160 twin pairs with weighed gender and zygosity were randomly selected from the 582 families. Two of the six pre-trained CAI-DRS coders completed differentiation-relatedness coding for each twin pair independently on sections of the CAI transcripts. Except for the trainer of the CAI-DRS, all the other five trained CAI-DRS coders were not CAI interviewers and had no prior knowledge of either the coding system or the content of the CAI coding. Each of the coders was blind to the zygosity and demographics of the twin and had no knowledge of the interview content of the other twin. The trainer of the CAI-DRS only coded the CAIs that she was not involved in at previous stages, ensuring she was blind to both the participant information and the CAI content, when coding differentiation-relatedness scores.

#### 4.4.4 Overall Data Analysis Plan

The scores of the Differentiated-Relatedness Scale is theoretically more close to ordinal variables, as each score represents a uniquely defined level of mental representation of self and other and from lower levels to higher levels the cognitive as well affective components of representations become increasingly mature, articulated and complex. However, in the study of this thesis, the DRs scores were analyzed as interval variables similarly as previous empirical studies of the scale (e.g. Levy et al., 1998; Luyten et al., 2006; Vermote, 2005). In this way, the dynamic developmental feature of the levels of mental representation of self and other can be better presented using group means. For instance, a mean score of the DRs 5.70 in a specific sample indicated a dynamic move from Level 5 (Semi-Differentiation) of mental representation of self and other towards Level 6 (Emergence of Object Constancy) with an increasing ability to differentiate, articulate as well as better integrated sense of self and other that are almost equivalent to Level 6. This feature of the means otherwise would not be indicated in analysis of the ordinal variables.

Based on the characteristics of the CAI-DRS and the normative nature of the sample, this study used parametric tests under the assumption that the scores of the DRS are normally distributed (Altman & Bland, 1995). Considering the large sample size of this study ( $N=320$ ), it could be argued that with large enough sample size ( $N>30$ ), the distribution of the data tend to be normal regardless of the shape of the data and the violation of the normality assumption is minimized (Elliott & Woodward, 2007; Field, 2013; Pallant, 2013). However, the vision inspections of the normality of the scores of the Differentiation-Relatedness in this study are presented using frequency distribution of histogram (*Chart 6.1*) in Chapter 6 and Quantile-Quantile Plot (Q-Q plots) plots in Appendix (*Chart 4.1*, *Chart 4.2* and *Chart 4.3*). In Chapter 6, due to the unequal sample sizes when conducting analyses of the discriminative and concurrent validity of the CAI-DRS, alternative non-parametric testes were performed and the results were included in the Appendix.

For the reliability study of the CAI-DRS, the statistic analysis used is Intraclass Correlation (ICC), as it is one of the most commonly used methods of assessing inter-rater reliability for ordinal as well as interval variables with two or more coders. The ICC measure estimates the inter-rater reliability by measure the degree in which the

independent coders of the CAI-DRS consistently agree with each other incorporating the magnitude of the disagreement. The more detailed analysis of the ICC of the interrater reliability in this study is presented in Chapter 5. As part of the reliability of the CAI-DRS measure, the internal consistency reliability of the measure was examined using Pearson Correlation between the items of the scale as well as Cronbach's alpha within each section of the scale (i.e. self-description, mother-description and father description). Both of the two internal consistency tests aimed to estimate the degrees of the same-construct items within the CAI-DRS could yield consistent results when the measure was administered to a group of people on one occasion. In each section of the CAI-DRS, the inter-item correlation was calculated using Pearson Correlation as items of articulation, qualities of relationship (or self-regard) and the scores of Differentiation-Relatedness Scale are designed to measure the same construct of mental representation of self and other based on the given narrative. Cronbach's Alpha is used here to examine the overall consistency of the items within each section of the CAI-DRS.

Following the test of interrater reliability and internal consistency of the CAI-DRS measure, Chapter 6 examines the discriminative and concurrent validity of the measure. The statistical analysis used is liner regression test to compare the mean differences of the DRS across each of the independent variable tested. Furthermore, standard errors were corrected in these regression tests to account for the intraclass correlation of twins. The more detailed statistical analysis used can be viewed in Chapter 6 Section 6.2.3. Chapter 7 aims to examine the convergent validity of the CAI-DRS in relation to the classifications and dimensional linear scales of the Child Attachment Interview. The statistical analysis used is linear regression as in Chapter 6. Furthermore, the associations with symptoms of psychopathology were also compared between levels of mental representation of self and attachment security. This test aims to clarify whether the convergent validity between the two measures occurs as a result of the common correlations with certain symptoms. Further statistical analysis of the convergent validity is presented in Chapter 7 Section 7.3.3.

In Chapter 8, the estimates of heritability of mental representation of self and other were examined by the structured model-fitting analysis. Quantitative behavioural genetics is one of the most powerful methodologies available to detect genetic and environmental influences on behavioural traits and it has already made substantial impact on ways of



understanding individual differences in child's cognitive abilities, socio-emotional development and psychopathology (Plomin, DeFries, Knopik, & Neiderhiser, 2013). Different from difficult molecular attempts to search for specific candidate genes underpinning attachment (Barry et al., 2008; Chen et al., 2011; Luijk et al., 2011; Spangler et al., 2009), the quantitative method provides estimates of total genetic and shared and non-shared environmental influences on human characteristics as well as the interaction between genes and environment (Gilger & Hershberger, 1998; Plomin, Owen, & McGuffin, 1994). Consistent with the epidemiological approach, behavioural-genetic studies on mental representations will be able to provide us a better insight into the causal effects of both genes and environment and therefore extend our knowledge of individual differences in normal and disrupted personality development (Caspi & Shiner, 2006; Cicchetti & Blender, 2006; Rutter & Sroufe, 2000). Apart from testing potential heritability, the methodology of behavioural genetics also allows us to differentiate the non-shared environmental influences that are unique to each child within a family (Plomin & Daniels, 1987; Rowe & Plomin, 1981; Turkheimer & Waldron, 2000) from the shared environmental factors such as family socio-economic status, parental marital quality and shared parenting experience. Non-shared environmental influences are not only important for understanding the development of individual differences within and beyond family context (Pike & Plomin, 1996), but also pose challenges for some commonly presumed shared-environmental effects in personality development such as maternal sensitivity and attachment (Fearon et al., 2006). The limitations of the behavioural-genetic analysis are discussed in Chapter 9.

## **PART III EMPIRICAL INVESTIGATIONS**

## **Chapter 5 Initial Test of the CAI-DRS: Inter-Rater Reliability and Internal Consistency**

### **5.1 Introduction**

Prior to this study, the author and an external expert coder of the original DRS measure used the DRS on a set of 10 Child Attachment Interview narratives as a preliminary attempt to apply the DRS to the CAI. Both the author and the external coder are reliable coders of the DRS on the Object Relation Inventory. After the trial run, the practicability and issues which occurred when applying the DRS directly to semi-structured interviews were discussed and reviewed. It was agreed that the DRS could be used on sections of the CAI, however changes and adaptations were required in order to bridge the gap between spontaneous descriptions and semi-structured interview narratives. After the development of the CAI-DRS manual (see Appendix), an initial test was conducted to examine the inter-rater reliability and inter-item consistency of the newly adapted CAI-DRS measure. The study included two stages. At stage 1, a graduate student with some knowledge of object relations theory and attachment theory was trained to use the new scoring manual. The coding scores of the CAI-DRS were compared with the codings of an expert coder (i.e. the author). The manual was subsequently revised after discussing vague and divergent parts that came to light in the first stage. An addendum to the important scoring notes was added to help future coders clarify some difficult areas. At the second stage of the reliability test, four naïve coders who had no prior knowledge of the original DRS or attachment theory were trained by the expert coder in order to test the inter-rater reliability and the internal consistency of the refined measure.

### **5.2 Method**

For the CAI-DRS reliability test, three sets of interviews were selected from the overall sample of the study. At coding stage 1, two sets of CAIs were selected for initial testing. As different attachment patterns are reflected in varying narrative styles, Set 1 interviews (N=10) were randomly selected from interviews with pre-coded attachment classifications. The set consisted of interviews classified as Secure, Dismissing, Preoccupied and Disorganized attachment. However, during the coding process of the

reliability set, CAI-DRS coders were blind to the attachment classifications. Set 2 interviews (N=10) were randomly selected from the sample interviews without considering the attachment classifications. At Stage 2, Set 1 and an additional Set 3 with a total of 20 interviews were selected for the four naïve coders. Both Set 1 and Set 3 included interviews that were classified with different attachments patterns to ensure reliability for coding different types of narratives.

### ***Procedure of the Reliability Study***

After the development of the CAI-DRS coding manual, the expert coder (i.e. the author) trained a graduate student in four half-day sessions. The expert coder was reliability trained to use the Differentiation-Relatedness Scale on the Object Relations Inventory and adapted the DRS Manual to code CAI narratives. In the first and second training session the student was informed about the literature and the original DRS Manual. In the following two sessions, the graduate student was trained to familiarize herself with the new CAI-DRS coding manual and coded three in-session codings of the CAI interviews with the expert coder. The in-session coding included a detailed illustration of how to use the manual as well as how to understand each item of the measure in each interview case. Linguistic markers and important notes were addressed. Differences and vague areas were also discussed. After the training, a set of 10 interviews was provided as an initial reliability set (Set 1). The scores were later compared with those of the expert coder, which had led to the refinement of the manual. After a few more coding reviews, another set of randomly selected interviews (Set 2) were given to the graduate student to code independently.

At Stage 2, four interns were trained by the expert coder to use the refined coding manual. Three of them were recruited from TEDS attachment study in which they had previously transcribed CAIs. They had some familiarity with the interview narratives, however none of them had any prior knowledge of attachment theory or object relation theory. Another coder was a newly recruited MSc student who had just enrolled in her course and had no prior knowledge of attachment theory or object relation theory, as the other three coders. All of the coders were trained in three afternoon sessions. The first session focused on the theoretical background to the measure and various items in the manual of the CAI-DRS with the main emphasis on the levels of Differentiation-

Relatedness. No information was given about the original DRS manual. The second and third training sessions were targeted at using the manual to score interview cases. In total, 8 interviews were discussed together as training examples. Three were in-session exercises and five were coded independently and reviewed together at a later time with the expert coder's annotated transcripts. Following the training, two sets of 10 interviews (N=20) were given to the interns as reliability sets (Set 1 and Set 3).

As described in Chapter 4, Section 4.4.4, the inter-rater reliability of the CAI-DRS was analysed in SPSS using Intraclass Correlation, which describes the degrees of agreement among five coders, including the expert coder. Because the raters in this study are consistent raters working as a sample for the reliability test of the CAI-DRS measure, the ICCs were calculated using the two-way random consistency model. Unlike ICC one-way random or two-way mixed, this ICC calculation models both the effect of the rater and the effect of the rated case, and it assumes both are drawn from a larger population, hence the random effects model. The ICC statistical results were reported by single-measure results of the mean scores, as coders will code independently in the future study after each achieving a reliable level of coding. Within the 20 codings of Stage 2, internal consistency of the CAI-DRS was examined using the Pearson inter-item correlation matrix within each section, namely self-description, mother-description, father-description and twin-description. Related items were analyzed using the Cronbach's alpha to examine the internal consistency of each of the 3 items in the section.

## **5.3 Results**

### **5.3.1 Stage 1**

For Stage 1, the expert coder and the trained graduate coder's scores were compared using SPSS. Apart from the categorical data of item C1 using percentages of agreement, analyses of other items were computed by reliability analysis ICC two-way random consistency model. The results are shown in *Table 5.2* below.

**Table 5.2 Inter-Rater Reliability Between the Graduate Student and the Expert Coder**

Items		Set 1 (N=10)		Set 2 (N=10)	
		ICC <sup>a</sup>	95% CI <sup>c</sup>	ICC	95% CI
Self - Description	C1 Mode of self-description	.90 <sup>b</sup>		.80 <sup>b</sup>	
	C2 Articulation	.90	.64 to .97	.87	.57 to .97
	C3 Self-regard	.69	.15 to .91	.84	.49 to .96
	C4 Self-DRS	.50	-.15 to .85	.85	.50 to .96
Relationship with Mother	C5 Articulation	.57	-.06 to .87	.68	.14 to .91
	C6 Quality of relationship	.74	.25 to .93	.82	.42 to .95
	C7 Mother-DRS	.65	.09 to .90	.84	.47 to .96
Relationship with Father	C8 Articulation	.92	.71 to .98	.91	.67 to .98
	C9 Quality of relationship	.57	-.05 to .87	.67	.11 to .91
	C10 Father-DRS	.74	.24 to .93	.86	.54 to .96
Relationship with the Other Twin	C11 Reference of the twin	.42	-.25 to .65	.81	.40 to .95
	C12 Quality of relationship	.34	-.33 to .78	.74	.25 to .93
	C13 Twin-DRS	.44	-.22 to .82	.72	.21 to .92

<sup>a</sup> ICC=Intraclass Correlation using two-way random consistency model; single measure result; <sup>b</sup> Percentages of agreement between two coders; <sup>c</sup> CI=confidence Interval

According to the commonly-cited cut-offs for qualitative ratings of agreement based on ICC values (Cicchetti, 1994), inter-rater reliability is regarded as poor for ICC values less than .40, fair for ICC values between .40 and .59, good for values between .60 and .74 and excellent for values above .75. In this study, ICC results for 7 items showed good (ICC range .60 to .74) to excellent (range from .75 to 1) agreement between two coders. However, in this pilot study, the items of C4 Self-DRS, C5 Articulation of Relationship with Mother, C9 Quality of Relationship with Father and the overall Twin Section showed fair agreement in the ICC range .40 to .59. Item C12 Quality of the Twin Relationship showed poor reliability with a value in the ICC range lower than .40. After discussing and clarifying some of the coding items, it was demonstrated in the second reliability set that the ICC results were largely improved. Most scores were in the excellent range and the four items of C5, C9, C12 and C13 were also in the range of good reliability. The twin section had improved considerably, however the Twin-DRS might need further validation with other coders considering the difficulties of the coding process.

### 5.3.2 Stage 2

In the second stage of the study, the coding scores (N=20) of 4 naïve coders were analyzed in SPSS using ICCs with a two-way random consistency model. The two sets

of reliability interviews included a mixture of attachment styles. ICCs were computed at 95% confidence interval. The degrees of agreement among the five coders including the expert coder were reported by single-measure results of the mean scores, as coders will code independently in the future study after each achieving a reliable level of coding. The reliability results are presented in *Table 5.3* below. Except for the C13 Twin-DRS, the ICC values of other items in the scale were in the range of good to excellent agreement. The ICC values of the DRS in the reliability set ranged from .67 to .71. Comparing *Table 5.3* and *Table 5.2*, the ICC values in the second stage were relatively lower than the results of the graduate student's reliability Set 2 in the first stage. It should be noted that Set 2 in the first study was a random selection of interviews, whereas both Set 1 and Set 3 covered a fuller range of different attachment narrative styles. Furthermore, the four naïve coders were provided with modified shortened training with less, or no, information on the original DRS manual. The newly adapted CAI-DRS manual was the only manual for reference in the coding process.

**Table 5.3 Inter-Rater Reliability among Four Naïve Coders and the Expert Coder**

		Expert Coder & 4 Naïve Coders		
	Item	Mean (SD)	ICC <sup>a</sup>	95% CI
Self	C2 Articulation	5.44(1.25)	.72	.55 to .86
	C3 Self-regard	5.55(.96)	.61	.42 to .79
	C4 Self-DRS	5.53(1.24)	.67	.49 to .83
Mother	C5 Articulation	5.36(1.17)	.63	.44 to .80
	C6 Quality of relationship	5.28 (1.89)	.81	.68 to .91
	C7 Mother-DRS	5.44 (1.24)	.71	.54 to .85
Father	C8 Articulation	5.21 (1.66)	.80	.67 to .90
	C9 Quality of relationship	5.21 (1.39)	.64	.45 to .81
	C10 Father-DRS	5.37 (1.18)	.67	.49 to .83
Twin	C11 Reference of the twin	4.87 (.90)	.60	.41 to .79
	C12 Quality of relationship	5.29 (1.27)	.61	.42 to .79
	C13 Twin-DRS	5.05 (1.35)	.55	.35 to .75

<sup>a</sup> two-way random consistency; single measure results

As an indicator of internal consistency of the CAI-DRS measure, the inter-item correlations of the CAI-DRS measure are presented below in *Table 5.4* using Pearson Correlations. The overall pattern of linear regression among all the items was in a positive direction. In the Self-Description section, C4 Self-DRS as expected significantly correlated with C2 Articulation ( $r=.83$ ,  $p<.01$ ) and C3 Self-Regard ( $r=.75$ ,  $p<.01$ ). The correlation coefficient indicated good correlation for using C2 and C3 to

arrive at an overall score of the Self-DRS in the Self-Description section without suggesting possibly redundant overlapping among these three items. In the Relationship with Mother section, C5 Articulation ( $r=.86$ ,  $p<.01$ ) and C6 Quality of Relationship ( $r=.90$ ,  $p<.01$ ) showed good correlation with the Mother-DRS. Similar results were also found within the Description of the Relationship with Father section where C8 Articulation ( $r=.79$ ,  $p<.01$ ) and C9 Quality of Relationship ( $r=.73$ ,  $p<.01$ ) significantly correlated with C10 Father-DRS. In the Twin section, there was good correlation between C12 Quality of the Twin Relationship and the Twin-DRS ( $r=.71$ ,  $p<.01$ ). The other item, C11 Reference to the Other Twin, as expected showed moderate to low correlation with other items in the DRS, for the reason that both the low and high end of this item scale were expected to have a negative correlation with other items, and only the middle range of the scale might be related to higher scores in other items. In other words, the scale of item C11 was expected to be neither significantly correlated in a positive direction, nor a negative direction with other items. This scale was intended to be used separately from other scales in the CAI-DRS. In addition, the cross sectional scores of DRS indicate some good correlations with each other. Self-DRS significantly correlates to C7 Mother-DRS ( $r=.63$ ,  $p<.01$ ) and C10 Father-DRS ( $r=.65$ ,  $p<.01$ ), and the correlation between Mother-DRS and Father-DRS is  $.83$  ( $r=.83$ ,  $p<.01$ ).

**Table 5.4 Inter-Item Correlation Matrix (N=20)**

	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
C2	-	.59**	.83**	.80**	.69**	.61**	.78**	.38	.68**	.47*	.42
C3	.59**	-	.75**	.60**	.54*	.50*	.44	.44	.54*	.45*	.76**
C4	.83**	.75**	-	.76**	.73**	.62**	.64**	.45*	.65**	.67**	.52*
C5	.80**	.60**	.76**	-	.77**	.86**	.76**	.38	.75**	.46*	.29
C6	.69**	.54*	.73**	.77**	-	.90**	.74**	.53*	.87**	.48*	.43
C7	.61**	.50*	.63**	.86**	.90**	-	.68*	.47*	.83**	.31	.32
C8	.78**	.44	.64**	.76**	.74**	.68**	-	.37	.79**	.44	.34
C9	.38	.44	.45*	.38	.53*	.47*	.37	-	.73**	.30	.79**
C10	.68**	.54*	.65**	.75**	.87**	.83**	.79**	.73**	-	.42	.59**
C11	.47*	.45*	.67**	.46*	.48*	.31	.44	.30	.42	-	.31
C12	.43*	.77**	.52*	.29	.43	.32	.34	.80**	.59**	.31	-
C13	.77**	.76**	.82**	.75**	.80**	.70**	.75**	.64**	.82**	.50*	.71**

\*\**. Correlation is significant at the 0.01 level (2-tailed).*

\**. Correlation is significant at the 0.05 level (2-tailed).*



**Table 5.5 Cronbach's Alpha of the Measure of Internal Consistency (N=20)**

	Cronbach's alpha
Self-description (C2, C3, C4)	.88
Mother-description (C5, C6, C7)	.91
Father-description (C8, C9, C10)	.81
Overall (C4, C7, C10)	.86

In parallel with the Pearson correlation matrix, Cronbach's alpha was computed to examine the internal consistency within each of the scale sections (*Table 5.5*). Judging by the alpha value range (Streiner, 2003), both the  $\alpha$  value in the Self-Description ( $\alpha=.88$ ) and Relationship with Father section ( $\alpha=.81$ ) suggested good internal consistency. The Relationship with Mother section also showed good internal consistency ( $\alpha=.91$ ), however the result may imply possible redundancy among the items. The overall DRS among the Self-DRS, the Mother-DRS and the Father-DRS showed good internal consistency with an  $\alpha$  value of .86. The Cronbach's alpha was not calculated in the twin section due to the features of item C11.

## **5.4 Discussion**

The aim of the two-stage study in this chapter was to examine the inter-rater reliability and internal consistency reliability of the newly adapted CAI-DRS. In the first stage (Set 1), despite agreement in the articulation of relationship with mother and quality of relationship with father, the Mother-DRS and the Father-DRS presented good inter-rater reliability. Based on the results, further clarifications were provided for the graduate students to reach a better level of agreement on scores for these two items. The Self-DRS and the overall twin section are worth further review. As shown in the results, C2 Articulation and C3 Self-Regard were more reliable in the Self-Description section, however there was a relatively low agreement on Self-DRS. It was found in the later review process, after Set 1, that the lower agreement was largely due to some difficulties distinguishing between idealizing and positive descriptions of self, and some different understandings of the specific narrative content in some interviews by the two

coders. In the twin section, the three items C11, C12 and C13 had relatively low agreement between two raters even after further discussion. Apart from a similar difficulty in differentiating between idealizing and positive descriptions to that mentioned in coding the Self-DRS, another particular issue was the narrative structure of the twin section. Questions were more general and directional, and therefore provided less opportunity for the adolescents to elaborate their narratives. For instance, both positive and negative aspects of the twin relationship were asked for in the questions of argument and support respectively. It became difficult when the adolescent followed the question in a non-specific way but only with conventional concerns. In addition, the twin section was the last part of the CAI interview, and the adolescents might have provided less narrative towards the end. Prior to the pilot study with the trained graduate, the preliminary test between two expert coders had already raised concerns about the twin section, that it might be difficult to arrive at a Twin-DRS score due to a lack of sufficient information. After the first reliability set in Stage 1, the scores of the expert coder and the graduate student were compared and the disagreements were discussed in order to find the possible reasons for the low inter-rater reliability of the less satisfactory items. The items C5, C9 and C11-13 were considered to require clarification. As can be observed from the above results section, in the second reliability set, the inter-rater reliability scores between the expert coder and the graduate student coder improved significantly after clarifying the confusions and divergences in the coding manual. The results showed good inter-rater reliability for the newly adapted manual. However, it should be noted that the improved ICC might also be a result of the random selection of interviews where specific difficult narratives, such as disorganized ones, were not included in Set 2. Therefore in the second stage of the reliability study, 20 interviews were selected with varieties of attachment styles for another four naïve coders.

After the pilot study, the manual was revised and modified according to the results. The training for coders was adjusted on the basis of the experience of Stage 1. In the second stage, the four naïve coders, without prior knowledge of the development of the manual or knowledge of object relations or attachment theory, were trained in a revised training program together. The inter-rater reliability of the newly adapted CAI-DRS showed a good result of ICC .67 to .71. However this was lower than the reliability result of .83 in Differentiation-Relatedness Scale reliability scored on the Object Relation Inventory

(Stayner, 1992; 1994; Vermote, 2005). As the study in this chapter only presented the reliability test of the adapted CAI-DRS after the initial training phase and with naïve raters, there is still much room for improvement and refinement in order to train coders to score the CAI-DRS more consistently. At this stage, the ICC of .67 to .71 seems to be a good inter-rater reliability to start with.

For item C13 Twin-DRS, the result showed only fair agreement of .55 in Stage 2, and the discussion among the five coders that followed demonstrated that the scores for the Twin-DRS were difficult to reach agreement on because of the influences of the directional questions and some more specific questions in the twin section and as a result of limited elaboration in the last part of the interview. Considering the concerns raised by two expert coders that the narrative of the twin section was not sufficient to arrive at a reliable Twin-DRS, especially because the structure and questions in the interviews were different from the other three sections, and the questionable results of the C13 in Stage 1 and Stage 2, the item of Twin-DRS was dropped from future study when coding the CAI twin section. Only item C11 Reference to the Other Twin and C12 Quality of Twin Relationship remained.

In Stage 2, the results of both the Pearson correlation matrix and the Cronbach's alpha suggested good internal consistency for the items in the CAI-DRS. In the development of the CAI-DRS, the articulation items and quality of relationship items were designed to arrive at an overall DRS for each of the description sections. In the Pearson correlation matrix, the results indicated both items of articulation and quality of the relationship correlated significantly with the DRS in each section and retained a fair regression value, suggesting items were not overlapping or redundant. Regarding the internal consistency, the only exception was the section Description of the Relationship with Mother where the Cronbach's alpha was .91. This may imply possible redundancy in the item. As shown in the correlation matrix, articulation showed good correlation with quality of the relationship and the Mother-DRS, however the quality of relationship was highly correlated with the Mother-DRS, which might have had a big influence on the Cronbach's alpha value. Considering the similar structures of the items across the CAI-DRS measure and the sample of 20 reliability interviews, no further modification was made to the items in the Mother-Description section.

In summary, both Stage 1 and Stage 2 showed good results for the internal consistency and the inter-rater reliability of the new CAI-DRS manual at this initial testing phase. Cross sectional results of the differentiation-relatedness scores in the descriptions of self and parents indicated some good correlations with each other. The Self-DRS was shown to significantly correlate with the Mother-DRS ( $r=.63$ ,  $p<.01$ ) and the Father-DRS ( $r=.65$ ,  $p<.01$ ), and the correlation between the Mother-DRS and the Father-DRS was  $.83$  ( $p<.01$ ). The Cronbach's alpha in the preliminary test of the three sections was in the range  $.81-.91$ . In terms of the inter-rater reliability, the overall Intraclass Correlation coefficient of the expert rater and a trained master's student in the reliability test was  $.85$ . The second stage of the study showed a good enough inter-rater reliability of  $.67$  to  $.71$  for assessing object representations of self and others on the semi-structured Child Attachment Interview by a range of coders at an initial testing stage of the CAI-DRS.

## **Chapter 6 Further Testing of the CAI-DRS: Discriminative Validity and Concurrent Validity**

### **6.1 Introduction**

Blatt's two polarities model of personality development maintains the centrality of dialectic synergistic interactions between the fundamental developmental processes of self-definition and interpersonal relatedness (Blatt, 1974, 2008; Blatt & Blass, 1990, 1992; Blatt & Shichman, 1983; Luyten & Blatt, 2013). This theoretical paradigm has provided a systematic psychodynamic structural framework to understand adaptive and disrupted personality development across life span. In normal personality development, the balance between the two developmental lines of self-definition and relatedness creates a fundamental dynamic that is central to the development of mature personality organization and healthy psychological functioning, whereas severe disruptions of the normal dialectical developmental process can lead to a defensive preoccupation with one of the polarities at the expense of the development of the other (Blatt, 1995; Blatt & Blass, 1990; Blatt & Luyten, 2009; Blatt & Shichman, 1983). Psychopathology, therefore, can occur as a result of distorted modes of adaptation in attempts to maintain a balance between two dimensions of relatedness and self-definition (for review of the two polarities model see Chapter 1). Within the theoretical framework of the two polarities model in normal and disrupted personality development, Blatt and his colleagues (Blatt, 1974; Blatt & Lerner, 1983a, 1983b; Blatt et al., 1975) have proposed a more integrated formulation of development of mental representation of self and other incorporating object relations theory (e.g. Kernberg, 1976; Loewald, 1978; Mahler et al., 1975; Sandler & Rosenblatt, 1962; Stern, 1985) and cognitive developmental theory (Piaget, 1926; Werner, 1948; Werner & Kaplan, 1963). Subsequently, an operationalized systematic assessment measure of Differentiation-Relatedness Scale (DR-S; Diamond et al., 1993/2012) was developed to assess self and object representations on spontaneous descriptions of the Object Relations Inventory (ORI; Blatt, Chevron, et al., 1988). The Differentiation-Relatedness Scale views the development of the representation of self and other in two simultaneously progressing developmental lines of self-definition and interpersonal relatedness, and the underlying mental representation of self and other evolve epigenetically from an amorphous, global

representation, to a semi-differentiated emphasis on part properties and functions, to an increasingly mature, cohesive and complex cognitive structure of self and other linked by affective qualities (see Chapter 4).

As reviewed in Chapter 4, previous empirical studies have shown that the Differentiation-Relatedness levels were reported to differentiate between psychiatric inpatients and normal controls (Luyten et al., 2006). Within the clinical sample, levels of differentiation-relatedness, especially assessed on self-description, have been found to correlate significantly with independent assessment of levels of clinical functioning in a seriously disturbed inpatient sample of adolescents and young adults (Blatt, Stayner, et al., 1996). Kaslow and colleagues (1998) found that levels of differentiation-relatedness were significantly higher among psychiatric patients who had never attempted suicide than psychiatric patients who had made recent suicide attempts. Furthermore, childhood abuse and neglect were also shown to negatively correlate with levels of differentiation-relatedness and DRS levels mediated the relationship between a history of abuse and neglect and suicide attempts. Similar results were found in patients' suicide attempts compared to medical, non-psychiatric controls (Twomey et al., 2000). Although research of the Differentiation-Relatedness Scale had contributed substantially to understanding psychopathology, clinical functioning as well as corresponding therapeutic changes in adult clinical populations, only a limited amount of recent research has examined mental representation of adolescents using assessment constructs such as the Conceptual Level Scale (CL; Blatt, Chevron, et al., 1988; Blatt et al., 1979) on the Children's version of the Object Relation Inventory (CORI; Waniell et al., 2006) and the Adolescent form of the Depressive Experience Questionnaire (Blatt, Schaffer, et al., 1992). Studies have primarily emphasized various pathological expressions in adolescence, such as depression and internalizing/externalizing problem behaviours (e.g. Besser & Blatt, 2007; Blatt, Auerbach, & Levy, 1997; Shahar et al., 2004). No specific empirical investigation has been conducted on the levels of differentiation-relatedness in normal adolescent development and their psychosocial functioning.

Adolescence marks a critical developmental phase in both normal and disrupted personality development across a range of personality theories (see Chapter 3). As illustrated in Erikson's (1959, 1968) epigenetic psychosocial model, adolescence is a crucial time of integration where successful integration between the two dimensions

results in the formation of a more consolidated self-identity and positive relatedness to others, and failure of integration may lead to the emergence or consolidation of many forms of psychopathology, especially personality disorders that are characterized by failures to integrate these two fundamental developmental dimensions (Blatt & Blass, 1990; Blatt & Luyten, 2009). In the development process of adolescence, the middle adolescence locates roughly between stages of object removal and attachment to a new object cathexis beyond primary object relationships, therefore this particular developmental stage marks distinctive features that differ from early adolescence or late adolescence, especially on issues of the maturity of intimacy on the relational capacity (Lewis, 1989). As reviewed in Chapter 3, the stage of middle adolescence in particular can be characterized by the mourning of the lost infantile object, an immediate and urgent need for relatedness and encounters of limited relatedness marked by a sense of disappointment as the adolescent tends to treat any developing relationship for wish fulfilment (Blos, 1962; Freud, 1958; Lewis, 1989).

Compared to adults, it is only recently that a body of research has emerged to start exploring the great value of the two polarities model for understanding normal and disrupted personality development in adolescence (Blatt & Luyten, 2009). Current and prior research on mental representations in adolescence, especially attachment studies, have largely focused on investigating children's mental representations of parents and the quality of the relational schemas (i.e. IWMs) to understand basic adaptive and maladaptive developmental processes (see Chapter 2). Studies have primarily addressed the centrality of the child's mental representations of mother and of father respectively in relation to symptoms or level of psychological adjustment. However, little empirical work has been done on the mental representation of self in adolescence, despite extensive emphasis on self in the literature and its pivotal position in understanding personality development and subjective experiences of patients (see Chapter 3, Section 3.4.2). The scarcity of research might be due to a lack of appropriate assessment measures or the assertion that measures evaluating a separate construct of self-representation from relational schemas are redundant or invalid prior to adulthood (see Chapter 2, Section 2.2.1). Some previous social-cognitive studies have addressed mental representation of self in middle childhood and adolescence, and found that positive self-representations were more likely to associate with better adjustment and diminished symptomatology (e.g. King et al., 1993; Segal & Blatt, 1993). Considering

the development of an increasingly integrated mind regarding both primary attachment figures around late adolescence and young adulthood (see Furman & Simon, 2004), the integration of past and past attachment experiences (Allen, 2008) and the expansion of adolescent's working models of diverse relationships (Furman et al., 2002), the assessment of representation of self might become essential around middle adolescence, as the self-representation will not only reflect an increasingly differentiated and consolidated self-identity, but also a more general state of mind regarding relatedness rather than only relying on relationship-specific representations in earlier childhood.

In this chapter, the mental representation of self as well as mental representation of significant others were examined in a sample of same-sex adolescent twins in their middle adolescence. In order to assess the levels of differentiation-relatedness on semi-structured Child Attachment Interviews, the CAI-DRS was developed on the basis of the original ORI Differentiation-Relatedness Scale manual. After establishing the initial inter-rater reliability and internal consistency of the new manual (see Chapter 5), this chapter will examine the discriminative validity and the concurrent validity of the CAI-DRS. The discriminative validity was tested on variables of socio-demographic factors of gender and ethnicity as well as the socioeconomic factors of household income, parents' occupational status and parents' educational levels. In the second part of this chapter, for concurrent validity, the DRS was tested with a self-report symptom inventory and a parent-report symptom inventory.

## **6.2 Method**

### **6.2.1. Participants**

In the current study, the participants were 160 pairs of same-sex twins with a mean age of 15.00 (SD=.26, range 14.09-15.87) at the assessment time. The sampling strategy and the characteristics of the overall sample of the main TEDS can be viewed in Chapter 4. The demographics of the sample in this study are summarized below in *Table 6.1* and *Table 6.2*.

As can be observed in these two tables, the predominant ethnic origins of participant twins were white (86.3%). The sample families had a median household income of £30,000-£50,000 per annum. The majority of the families had parents either in full or



part-time employment with only 3.8% of fathers and 10.6% of mothers unemployed. Approximately 19.7 % of the parents completed secondary school and 63.5% had achieved A-levels or above. Only a very small percentage of the parents (6.9% of the fathers and 1.9% of the mothers) did not have any qualifications. The socio-demographics of the sample in this study were relatively similar to the larger sample in the TEDS attachment project. In general, the families in the TEDS as well as in this study were more educated, more employable and had higher household income than the national average obtained from the Office of National Statistics. It has already been examined in the TEDS data that the participating families did not differ from those who were approached but did not take part in the study in terms of white versus non-white ethnicity. Nevertheless, the families that agreed to participate were more educated than those that were invited but did not take part (Fearon et al., 2013).

**Table 6.1 Descriptive Statistics of the Sample Demographics (N=160 pairs)**

	N (twin pairs)	Percentage (%)
<u>Gender</u>		
Female	80	50
Male	80	50
<u>Zygosity</u>		
Monozygotic	80	50
Dizygotic	80	50
<u>Ethnic origin of the child</u>		
White	138	86.3
Asian or Asian British	2	1.3
Black or Black British	3	1.9
Mixed	9	5.7
Other Ethnic Group	1	.6
No disclosure	2	1.3
<u>Household Income</u>		
0-10k p.a.	5	3.1
10-20k	21	13.1
20-30k	24	15.0
30-50k	29	18.1
50-70k	32	20.0
70k above	39	24.4

**Table 6.2 Occupation Status and Education Level of Parents**

	Father (N=160)		Mother (N=160)	
	N	%	N	%
<u>Occupation</u>				
FT employed	103	64.4	57	35.6
PT employed	5	3.1	60	37.5
Self-employed	34	21.3	19	11.9
Unemployed	6	3.8	17	10.6
<u>Education</u>				
None	11	6.9	3	1.9
GCSE's/O-levels	31	19.4	32	20.0
A-level	10	6.3	16	10.0
NVQ/HND	31	19.4	31	19.4
Degree	31	19.4	45	28.1
Postgraduate	21	13.1	18	11.3
Other	13	8.1	8	5.0

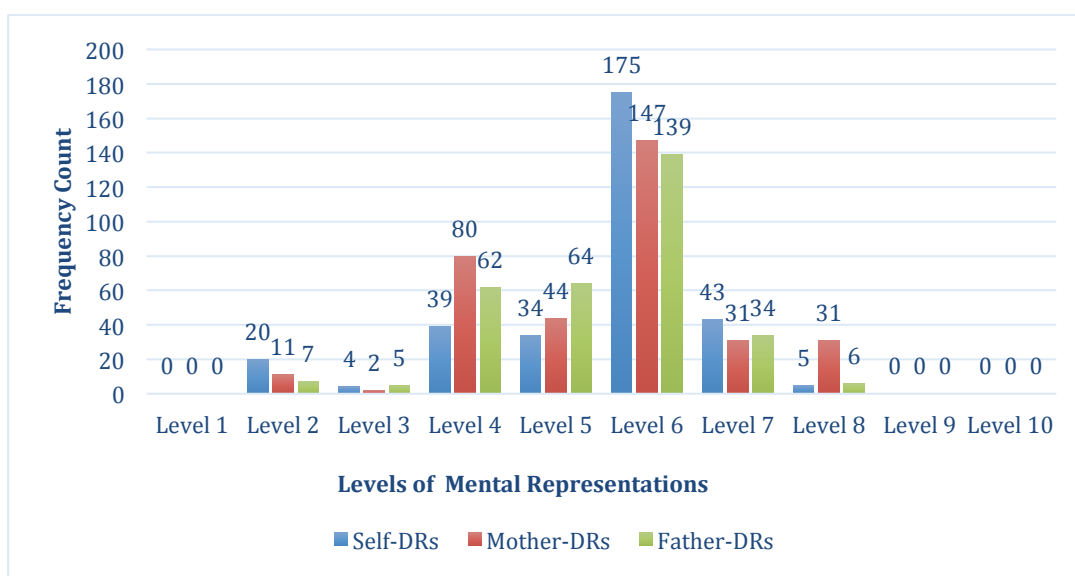
### 6.2.2. Measures

Apart from the adapted *CAI-DRS* measure, the *Youth's Inventory Self-Report* measure and the *Child & Adolescent Symptom Inventory* (parent-report) measure were used to examine the concurrent validity of the DRS scores. Both of the symptom measures are well-established standardized rating scales designed to assess the symptoms of adolescent disorders. The two measures contain analogous scale contents that are explicitly tied to the diagnostic criteria specified in the DSM-IV (American Psychiatric Association, 1994). They cover many symptom domains that are not essentially assessed by other rating scales, especially symptoms of more severe childhood psychopathology, for example Obsessive-Compulsive Disorder and Schizophrenia. The description of the measures used in this study can be reviewed in Chapter 4, Section 4.4.2.

## CAI-DRS

In this study sample (N=320), the overall mean score of Differentiation-Relatedness on self-description was 5.53 (SD=1.30), which was slightly higher than the mean scores on description of the relationship with mother (M=5.33, SD=1.21) and on description of the relationship with father (M=5.42, SD=1.15). The Self-DRS was correlated moderately with the Mother-DRS ( $r=.56$ ) and the Father-DRS ( $r=.49$ ) at the significance level  $p<.001$ . As a comparison, the correlation between the Mother DRS and Father-DRS was even stronger ( $r=.64$ ,  $p<.001$ ). *Chart 6.1* below, presents the distributions of the Differentiation-Relatedness Levels. As can be observed, the scores are in the range of 2 to 8 and the mode of each DRS is level 6 scored by around half of the sample.

**Chart 6.1 Distributions of Levels of the DRS (N=320)**



## Youth's Inventory-4 (YI-4)

The Youth's Inventory-4 (YI-4; Gadow & Sprafkin, 1999b) is a standardized self-report rating scale that assesses DSM-IV emotional and behavioural disorders in youths (American Psychiatric Association, 1994). In this sample of 160 twin pairs, the features of the symptom characteristics are summarized in *Table 6.3* below. As can be observed, using the symptom cut-off criterion from DSM-IV, the sample presented relatively small percentages of various disorders ranging from .30% to 17.2%. Specific Phobia

was the most frequently reported category by the youth based on their perceptions, followed by Compulsions (13.8%) and Social Phobia (13.1%).

### ***Child Adolescent Symptom Inventory-4R (CASI-4R)***

The distribution of the emotional or behavioural disorders of the sample in this study is summarized in *Table 6.3* above. The total valid number of CASI collected was 314 with 6 cases missing. The percentages of various disorders of this sample range from 0 to 26.1%. Despite some differences between self-report symptoms by the youth and symptoms reported by mothers in some of the specific disorders, the clinical cut-off percentages of the CASI-4R were relatively similar to the YI-4 results regarding the majority of the disorders. As can be observed from the table, Specific Phobia (26.1%) was confirmed to be the most frequently observed symptom category also reported by mothers. Obsessions (15.9%) and Panic Attack (12.7%) were also relatively more observable in this normative sample in comparison with other disorders.

**Table 6.3 Descriptive Summary of Participant Symptom Characteristics with Clinical Cut-off scores\***

	Youth's Inventory (N=320)		CASI-Mother (N=314)	
	N	%	N	%
AD/HD, Inattentive	25	7.8	25	8.0
AD/HD, Hyper-Imp	22	6.9	6	1.9
ADHD, Combined	8	2.5	1	.30
Conduct	14	4.4	5	1.6
Oppositional Defiant	29	9.1	40	12.7
Generalized Anxiety	23	7.2	3	1.0
Specific Phobia	55	17.2	82	26.1
Panic Attack	14	4.4	40	12.7
Obsessions	21	6.6	50	15.9
Compulsions	44	13.8	20	6.4
Disturbing Events/PTSD	13	4.1	16	5.1
Motor Tics	24	7.5	28	8.9
Vocal Tics	9	2.8	32	10.2
Somatization	8	2.5	17	5.4
Social Phobia	42	13.1	7	2.2
Separation Anxiety	1	.30	0	0
Schizoid Personality	2	.60	2	.60
Schizophrenia	1	.30	0	0
Major Depression	6	1.9	0	0

Dysthymia	17	5.3	5	1.6
Bipolar	19	5.9	2	.60
Anorexia	8	2.5	8	2.5
Bulimia	9	2.8	1	.30
Substance use	18	5.6		
Nocturnal Enuresis			0	0
Antisocial PD			1	.30
Enuresis, encopresis			1	.30
Autistic disorder			1	.30
Asperger's disorder			3	1.0

*\*YI-4 uses Symptom Cut-off scores against Symptom Criterion Score; CASI-4R uses Clinical Cut-off scores against Symptom Cut-off score*

### 6.2.3 Data Analysis

As outlined in Chapter 4, Section 4.4.4, parametric tests are used in this Chapter. However, considering the unequal sample sizes within some of the data analyses, alternative non-parametric tests are included in the Appendix.

The results of this chapter are presented in two sections. In the first part, the discriminative validity is examined by comparing mean scores of the DRS across variables of gender, ethnicity and SES factors. As discussed in Chapter 4, the Differentiation-Relatedness Scale on the Object Relations Inventory has been predominately used in clinical samples. The discriminant validity of the scale was reported by the significant associations between differentiation-relatedness levels and clinical functioning, and between DRS and degrees of clinical change that were independent of intelligence, age or socio-demographic factors (Vermote, 2005) as well as clinical variables such as length of hospitalization and age of onset (Stayner, 1994). Therefore, based on the previous validity study of the Differentiation-Relatedness Scale as well as the current available data in the major study of TEDS, the socio-demographic variables of gender, ethnicity and factors of Socio-Economic Status were selected as discriminative variables to be tested in this normative adolescent sample. The variables of gender, ethnicity and occupation status of parents are nominal scales, and the SES factors of Household Income and Education Level of Parents data were interval and ordinal scales. In this study, a serious linear regression test was performed to compare

the mean differences of the DRS across each of the independent variables respectively, as the aim of the study is to test the extent to which the CAI-DRS can differentiate different conditions within each of the individual variables such as genders, ethnic origins and SES factors.

In the second part of this study, concurrent validity of the CAI-DRS were examined by testing the scores of the CAI-DRS in relation to the well-validated symptom inventory measures of the self-report YI-4 and the parent-report CASI-4R. It should be noted that the sample is a normative adolescent twin sample, it is expected that the majority of the sample will be in the non-clinical cut-off group according to the symptom criterion scores of the YI-4 and CASI-4R, whereas only a small number of the sample participants will be expected to have higher scores of reported symptom that are in the clinical range. Therefore, the study conducted a two-step test in order to examine the concurrent validity of the CAI-DRS in relation to symptom inventory measures. In the first part, the scores of the CAI-DRS were correlated to the scores of both symptom inventory measures. Based on the significant results found, further tests were performed to examine whether the median level of the normative adolescent twin sample could differentiate adolescents with higher risk for particular psychopathology symptoms from those with lower risk. This test attempt is proposed on the basis of previous concurrent validity studies of the Differentiation-Relatedness Scale, in which level 6 (Emergent Object Constancy) was found to be the threshold that discriminated psychiatric patients from normal controls (Luyten et al., 2006), as well as differentiating between secure and insecure attachment (Levy et al., 1998).

Considering the predominant characteristics of this sample especially the low ratio of ethnic minority families, the concurrent validity tests of the CAI-DRS in relation to symptom inventory measures were also conducted only within the predominant ethnic group of white or white British. The results are presented in the Appendix (*Table 6.16 and Table 6.17*). As the sample of the study was twins, the possible effects of twin correlation were taken into account when performing the analyses. Instead of treating twins as unrelated individual participants, the data in this study were analyzed in observed family units. In order to correct the standard errors to account for the intraclass correlation of twins, the model used in this study was clustered robust standard errors (Huber-White standard errors) in Stata.

## 6.3 Results

### 6.3.1. The Discriminative Validity of the CAI-DRS

As presented in *Table 6.4* below, the observed mean scores of the Differentiation and Relatedness on Descriptions of Self, of Mother and of Father were relatively equivalent comparing male and female participants. Among different ethnic groups, it was reported that the Asian or Asian British group generally had higher scores of DRS whereas the Mix ethnic group had slightly lower scores. Apart from that, other ethnic groups had comparably similar DRS scores. The discriminative validity of the DRS was further examined by linear regression tests clustered by family units. It was reported there was no significant difference between male and female participants on the scales of the Self-DRS [ $F(1,159)=.02, p=.90$ ], Mother-DRS [ $F(1,159)=.14, p=.71$ ] and Father-DRS [ $F(1,158)=1.76, p=.19$ ]. Similar results were reported using Kruskal-Wallis H test that is the non-parametric version of the previous test comparing the independent variable of gender and an ordinal dependent variable of CAI-DRS scores. The non-parametric test showed that there was no significant difference in differentiation-relatedness scores between male and female adolescents (for statistical results see *Table 6.11* in Appendix).

Among ethnic groups of Asian or Asian British, Black or Black British, White and Mixed, the results of child's ethnic origin were reported to have a significant effect on the Self-DRS [ $F(3, 151)=13.18, p<.001$ ], the Mother-DRS [ $F(3, 151)=3.46, p=.02$ ] and the Father-DRS [ $F(3, 150)=5.51, p=.001$ ]. Subsequent Post-Hoc Tukey HSD tests were conducted to examine the significant result. The tests within the significant results regarding the Self-DRS showed that the Asian or Asian British group was significantly different from the Mixed ( $p=.049$ ) and the White group ( $p<.001$ ) however not different from the Black or Black British group ( $p=.23$ ). The Black or Black British group had a significant mean difference from the White group ( $p=.04$ ). Regarding the Mother-DRS, the main significant results among the ethnic groups only depended on the differentiation of the Asian or Asian British group from any of the other three ethnic groups (see *Table 6.12* in Appendix). For the Father-DRS, the post-hoc test reported an overall significant difference among the four groups except for the difference between Asian or Asian British and Black or Black British, and between Mixed group and White (see *Table 6.12* in Appendix). In summary, the Asian or Asian British was reported to have significant higher DRS than the other groups except for the group of Black or

Black British. Other ethnic groups have relatively similar DRS. Referencing the predominant White British group, the DRS of this group generally differed significantly from the DRS of the Asian or Asian British group as well as those of the Black or Black British group (with only the exception of the Mother-DRS between the White and the Black or Black British group). In comparison, non-parametric Kruskal-Wallis rank test showed that there was no significant difference among ethnic groups in Self-DRS or Mother-DRS. However, there was a significant difference in Father-DRS (for statistical results see Table 6.13 in Appendix).

**Table 6.4 Descriptive Summary of the DRS Comparing Gender and Ethnic Origins**

	Self-DRS			Mother-DRS			Father-DRS		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
<u>Gender</u>									
Male	160	5.54	1.27	160	5.31	1.21	160	5.48	1.23
Female	160	5.52	1.32	160	5.36	1.21	158	5.32	1.15
<u>Ethnic Origins</u>									
Asian or Asian British	4	6.00	.00	4	6.50	1.00	4	6.75	.96
Black or Black British	6	5.83	1.17	6	5.33	1.21	6	5.83	1.17
Mixed	18	5.44	1.29	18	5.33	1.14	16	4.81	1.32
White	276	5.50	1.34	276	5.33	1.21	275	5.54	1.13
Any other	2	6.00	.00	2	6.00	.00	2	5.50	2.12

The effect of parents' occupational status on DRS was evaluated by the four employment conditions: Unemployed, Part-Time Employed, Full-Time Employed and Self-Employed. *Table 6.5* below summarizes the number, means and standard deviations of the DRS regarding the occupation status of each parent respectively. As can be observed from the table, the Unemployed category of the Father's Occupation Status had overall the lowest scores of the DRS followed by Part-Time Employment. The DRS of the two categories were close to the score of 5 and below. In comparison, the DRS of the Full-Time Employment and the Self-Employment were generally higher and remained relatively equivalent. Regarding the Occupational Status of mother, the scores of the DRS were observed to be in a rather similar range. The results of linear regression clustered by family units showed that father's occupation status had a significant effect on the Self-DRS [ $F(3, 147)=4.04, p=.01$ ], however it did not show any significant effect on the Mother-DRS [ $F(3,147)=1.29, p=.28$ ] or the Father-DRS



[F(3,147)=.75, p=.53]. Post-hoc comparisons of the Self-DRS using the Tukey HSD test indicated that the mean score of the Self-DRS with FT employed father (M = 5.61, SD = 1.24) was significantly higher than the ones with Unemployed fathers (M = 4.58, SD = 1.31) and PT employed fathers (M=4.80, SD=1.75). Nevertheless, other conditions of employment did not significantly differ from each other on the Self-DRS. The results in relation to the occupational status of mothers showed that mother's employment condition did not have any significant effect on participant's Self-DRS [F(3,152)=1.09, p=.35], Mother-DRS [F(3,152)=.77, p=.52] or Father-DRS [F(3,151)=.31, p=.82]. The non-parametric tests showed similar results, that fathers' occupational status had a significant effect on the Self-DRS, not on Mother-DRS or Father-DRS (for statistical results see Table 6.14 in Appendix). Mothers' occupational status did not make significant difference to Self-DRS, Mother-DRS or Father-DRS (see Table 6.15 in Appendix).

**Table 6.5 Descriptive Summary of the DRS Regarding Parents' Occupation Status**

	Self-DRS			Mother-DRS			Father-DRS		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
<u>Father's occupation status</u>									
Unemployed	12	4.58	1.31	12	4.75	1.66	11	5.09	1.14
Full-Time Employed	206	5.61	1.24	206	5.37	1.18	206	5.50	1.14
Part-Time Employed	10	4.80	1.75	10	4.80	1.48	10	5.10	1.52
Self-Employed	68	5.46	1.42	68	5.51	1.07	68	5.37	1.12
<u>Mother's occupation status</u>									
Unemployed	34	5.59	1.10	34	5.50	1.14	34	5.59	1.10
Full-Time Employed	114	5.68	1.36	114	5.47	1.24	112	5.43	1.26
Part-Time Employed	120	5.36	1.29	120	5.23	1.19	119	5.41	1.09
Self-Employed	38	5.53	1.31	38	5.34	1.07	38	5.34	1.10

The relationship between the Family Household Income and the DRS was tested by linear regression. The results showed that there was a general positive correlation between household income and the DRS, which suggested a relationship between higher household income and higher DRS. The income correlated significantly at  $p < .05$  level with the Self-DRS ( $r = .15$ ,  $p = .02$ ) and the Father-DRS ( $r = .13$ ,  $p = .04$ ), however not with the Mother-DRS ( $r = .09$ ,  $p = .21$ ). Although significant at .05 level, the value of

correlation coefficients suggested only weak to negligible correlation ( $p < .02$ ). In terms of the Educational Levels of the Parents, the correlation tests showed that Father's Education Levels did not correlate significantly with the Self-DRS ( $r = .02$ ,  $p = .72$ ), the Mother-DRS ( $r = -.03$ ,  $p = .53$ ) or the Father-DRS ( $r = -.02$ ,  $p = .70$ ). Mother's Education Levels showed a positive direction of correlation with the DRS however correlations were not significant with the Self-DRS ( $r = .10$ ,  $p = .08$ ), the Mother-DRS ( $r = .07$ ,  $p = .24$ ) or the Father-DRS ( $r = .03$ ,  $p = .58$ ).

### 6.3.2 Concurrent Validity of the CAI-DRS

Prior to test the concurrent validity of the CAI-DRS with Symptom Inventory of the YI-4 and the CASI-4R respectively, the degrees of concordance between the self-report inventory results and the mother-report inventory results were examined. As presented in *Table 6.3* in Section 6.2.2, despite of some variations in percentages of clinical cut-offs reported in each of the disorder categories, the clinical-cut-off numbers in each symptom category of the YI-4 and the CASI-4R were both relatively small. Similarly, the descriptive statistics of the severity *T scores* of the YI-4 and the CASI-4R presented in *Table 6.6* below were both in the low risk range of the severity profile ( $T \leq 60$ ). The correlations between the YI-4 and the CASI-4R were significant in most of the symptom categories, except for Anorexia. In the three symptom categories of ADHD as well as Oppositional Defiant Disorder, the correlations between the two symptom measures were moderate, whereas other correlations were relatively weak. As the two symptom inventory measures were reported with relatively low to moderate concordance ( $r = .12-.48$ ) from two different reporting sources, the CAI-DRS measures were tested with both the self-report YI-4 and the Mother-report CASI-4R respectively in order to examine its concurrent validity.

The concurrent validity results of the CAI-DRS are presented in relation to the YI-4 in *Table 6.7* and the CASI-4R in *Table 6.8* below. Analyses of correlations excluding ethnic minority participants are included in the Appendix for reference (see *Table 6.16* and *Table 6.17*). As can be seen from *Table 6.7* Correlation Matrix of the DRS and the self-report Youth's Inventory-4, the statistics show that in general, the DRS did not show a correlation with the *T scores* of the YI-4. The correlation patterns were mixed with positive and negative coefficients. The coefficients of Bipolar ( $r = .14$ ) and AD/HD

Hyper-Impulsive ( $r=.12$ ) appeared to be significant, however correlations were both in positive directions. Among the three DRS, the Self-DRS showed a slightly clearer pattern of negative relations with the *T scores* of the YI-4, with the exceptions of AD/HD Hyper-Impulsive, Bipolar and Substance Use. As a comparison to results of the YI-4, the correlation matrix between the DRS and the CASI-4R reported by mothers were summarized in Table 6.8. Although not all significant, the correlation coefficients were overall more clearly presented in negative directions.

**Table 6.6 Descriptive Summary of YI-4 T Scores and CASI-4R T Scores and Their Correlations**

	Youth's Inventory		CASI-Mother		Correlation
	N	Mean(SD)	N	Mean (SD)	
AD/HD, Inattentive	320	50.76 (10.63)	311	52.59 (10.60)	.48**
AD/HD, Hyper-Imp	318	50.09 (10.10)	312	50.96 (11.69)	.38**
ADHD, Combined	318	50.35 (10.18)	309	52.04 (10.71)	.47**
Conduct	320	42.88 (2.32)	314	49.03 (6.97)	.18**
Antisocial PD	-	-	314	49.71 (10.03)	
Oppositional Defiant	320	47.87 (8.49)	314	54.84 (10.58)	.40**
Generalized Anxiety	320	52.10 (11.50)	313	51.13 (10.39)	.24**
Separation Anxiety	320	47.61 (6.29)	313	50.50 (11.59)	.25**
Schizoid Personality	-	-	314	49.84 (9.63)	
Schizophrenia	320	46.37 (5.67)	314	49.95 (7.06)	.14*
Major Depression	319	46.53 (7.11)	313	47.70 (6.79)	.18**
Dysthymia	320	44.10 (7.00)	314	50.23 (11.09)	.18**
Bipolar	320	55.75 (10.27)	313	49.22 (8.81)	.14*
Anorexia	320	41.07 (4.93)	313	48.89 (9.55)	.02
Bulimia	320	40.34 (4.54)	312	49.71 (9.90)	.12*
Substance use	320	44.20 (1.93)	-	-	

\*\**. Correlation is significant at the 0.01 level (2-tailed).* \**. Correlation is significant at the 0.05 level (2-tailed).*

**Table 6.7 Correlation Matrix of DRS and Youth's Symptom Inventory T scores (N=160 family clusters)**

	Self-DRS	Mother-DRS	Father-DRS
AD/HD, Inattentive	-.08	-.00	.00
AD/HD, Hyper-Imp	.02	.12*	.07
ADHD, Combined	-.03	.07	.05
Conduct	-.06	.05	-.02
Oppositional Defiant	-.06	.10	-.04
Generalized Anxiety	-.02	-.01	-.01
Separation Anxiety	-.01	-.01	-.04
Schizophrenia	-.07	-.02	-.09
Major Depression	-.03	.05	.03
Dysthymia	-.02	.06	.02
Bipolar	.14**	.11	.07
Anorexia	-.08	-.01	.02
Bulimia	-.03	-.04	-.01
Substance use	.02	.07	.03

**\*\*.** Correlation is significant at the 0.01 level (2-tailed).

**\*** Correlation is significant at the 0.05 level (2-tailed).

**Table 6.8 Correlation Matrix of DRS and CASI-4R T Scores Reported by Mothers (N=157 family clusters)**

	Self-DRS	Mother-DRS	Father-DRS
AD/HD, Inattentive	-.16**	-.11	-.03
AD/HD, Hyper-Imp	-.11	-.02	-.01
ADHD, Combined	-.16**	-.09	-.03
Conduct	-.17**	-.11	-.07
Antisocial PD	-.16**	-.12*	-.06
Oppositional Defiant	-.14*	-.03	-.08
Generalized Anxiety	-.13*	-.01	-.04
Separation Anxiety	-.07	-.06	-.09
Schizoid Personality	-.25**	-.15*	-.18**
Schizophrenia	-.21**	-.08	-.12*
Major Depression	-.08	.00	-.05
Dysthymia	-.14*	-.01	-.08
Bipolar	-.16	-.01	-.01
Anorexia	-.12*	-.02	-.07
Bulimia	-.10	-.02	-.07

**\*\*.** Correlation is significant at the 0.01 level (2-tailed).

Specifically, the levels of the Self-DRS were significantly correlated with *T scores* of majority Symptom Categories of the *CASI-4R* at the significant level of  $p < .05$  (except for AD/HD Hyper-Impulsive, Separation Anxiety, Major Depression, Bipolar and Bulimia). Horizontally across the Self-DRS, the Mother-DRS and the Father-DRS, Schizoid Personality Disorder was the only symptom category with the *T scores* that significantly correlated with all the three DRS, followed by Antisocial Personality Disorder and Schizophrenia with *T scores* correlated significantly with two of the DRS. It should also be stressed that although significant at  $p < .05$  level, the correlations between Self-DRS and symptom categories were rather weak.

Following the correlation results between the Self-DRS scores and *T scores* of the *CASI-4R*, series linear regression tests were performed to examine whether the Self-DRS scores differed significantly in the clinical and non-clinical subgroups of each symptom category of the *CASI* according to the criterion scores. The descriptive statistics of the Self-DRS in relation to each symptom category are summarized below in *Table 6.9*. As observed from the table, within most of the symptom groups, the clinical-cut-off subgroups had lower mean scores of the Self-DRS than the non-clinical cut-offs. The exceptions were Antisocial Personality Disorder ( $N=1$ ), Generalized Anxiety ( $N=3$ ), Anoxia ( $N=8$ ) and Bulimia ( $N=1$ ) with a rather small number of the clinical cut-offs, and Panic Attack ( $N=40$ ), Obsession ( $N=50$ ), Compulsion ( $N=20$ ), PTSD ( $N=16$ ) and Somatization ( $N=17$ ) with a relatively larger number in the clinical subgroups. Excluding the small clinical cut-off number of 0 and 1, the standard regression results showed that symptom categories of AD/HD Hyper-Impulsive, Conduct Disorder, Oppositional Defiant Disorder, Social Phobia, Schizoid Personality Disorder, Dysthymia, Bipolar and Asperger's disorder had significantly lower Self-DRS levels than the non-clinical subgroups. Using clustered analysis regression tests reducing the influences of correlated twin data, the results showed that previously significant symptom groups of Conduct Disorder and Oppositional Defiant Disorder became non-significant at  $p < .05$  level.

**Table 6.9 Descriptive Statistics and Linear Regression Results of the Self-DRS within Non-clinical and Clinical Cut-offs (N=314)**

	Non-clinical Cut-offs		Clinical Cut-offs		Regression results	Regression Cluster
	Self-DRS		Self-DRS			
CASI-Mother	N	Mean(SD)	N	Mean(SD)	(df=1,312)	(df=1, 156)
AD/HD, Inattentive	289	5.56(1.26)	25	5.12(1.54)	F=2.76, p=.098	F=1.94, p=.17
AD/HD, Hyper-Imp	308	5.55(1.28)	6	4.50(1.38)	F=3.95; p=.048*	F=4.04, p=.046*
ADHD, Combined	313	5.53(1.29)	1	4.00	F=1.42, p=.23	-
Conduct	309	5.56(1.25)	5	3.80(2.49)	F=9.42, p=.002**	F=3.08, p=.08
Oppositional Defiant	274	5.59(1.23)	40	5.13(1.59)	F=4.56, p=.03*	F=3.53,p=.06
Antisocial PD	313	5.52(1.29)	1	7.00	F=1.31, p=.25	-
Generalized Anxiety	311	5.53(1.29)	3	5.67(.58)	F=.03, p=.85	F=.24, p=.62
Specific Phobia	232	5.54(1.29)	82	5.49(1.30)	F=.11, p=.73	F=.13, p=.72
Panic Attack	274	5.52(1.34)	40	5.58(.81)	F=.06, p=.81	F=.12, p=.73
Obsessions	264	5.52(1.30)	50	5.56(1.22)	F=.04, p=.85	F=.04, p=.85
Compulsions	298	5.52(1.30)	20	5.69(1.08)	F=4.37, p=.04	F=2.37, p=.13
PTSD	298	5.52(1.30)	16	5.69(1.08)	F=.26, p=.61	F=.43, p=.52
Motor Tics	286	5.55(1.27)	28	5.36(1.50)	F=.55, p=.46	F=.39, p=.53
Vocal Tics	286	5.55(1.29)	32	5.38(1.29)	F=.48, p=.51	F=.46, p=.50
Somatization	297	5.52(1.30)	17	5.71(1.05)	F=.34, p=.56	F=.53, p=.47
Social Phobia	307	5.58(1.22)	7	3.14(1.95)	F=26.63, p<.001**	F=12.41, p<.001**
Separation Anxiety	314	5.53(1.29)	0	-	-	-
Schizoid Personality	312	5.55(1.26)	2	2.00(.00)	F=15.86, p<.001**	-
Schizophrenia	314	5.53(1.29)	0	-	-	-
Major Depression	314	5.53(1.29)	0	-	-	-
Dysthymia	309	5.56(1.25)	5	3.60(2.19)	F=11.85, p<.001**	F=4.96, p=.03*
Bipolar	312	5.55(1.26)	2	2.00(.00)	F=15.86, p<.001**	-
Anorexia	306	5.51(1.30)	8	6.25(.46)	F=2.59, p=.11	F=17.73, p<.001
Bulimia	313	5.53(1.29)	1	6.00	F=.13, p=.71	-
Nocturnal Enuresis	314	5.53(1.29)	0	-	-	-
Enuresis, encopresis	313	5.54(1.27)	1	2.00	F=7.71, p=.006**	-
Autistic disorder	313	5.54(1.27)	1	2.00	F=7.71, p=.006**	-
Asperger's disorder	311	5.56(1.25)	3	2.00(.00)	F=24.49, p<.001**	-

*\*\*.* Correlation is significant at the 0.01 level (2-tailed). *.\*.* Correlation is significant at the 0.05 level (2-tailed).

As illustrated by the previous results, the correlation coefficients of the Self-DRS and the severity *T scores* of the CASI-4R suggested weak correlations. One of reasons was that the sample in the study was a community sample with rather low risk ( $T \leq 60$ ) to psychopathology. Majority *T scores* were close to 50 or even lower within both

symptom measures (see *Table 6.6*). The DRS was in the range 2 to 8, with the majority scoring between 4 and 7 (see *Chart 6.1*). Thus, within this limited range, hardly any linear correlation could be formed. In the tests of the Self-DRS between the clinical and nonclinical cut-off subgroups, the results showed an overall tendency of lower levels of DRS in the clinical cut-off subgroups compared to the nonclinical subgroups. However the results were still restricted due to the relatively small numbers in clinical cut-off subgroups.

In the following part, the scores of the Self-DRS were divided into two subgroups Low Self-DRS and Normal-High Self-DRS at the distinguishing Level 5 according to theoretical hypothesis of the normative Self-DRS in adolescence (for theoretical evidence see Discussion), and regression tests were further performed to examine whether *T scores* of the CASI-4R differed significantly comparing the two subgroups of the Self-DRS. Although the *T scores* were mostly in the low risk range, it was expected to see some differences between the Low Levels of differentiation-relatedness of self and others (Level 1 to 4) and the Normal-High Levels (Level 5 and above). As can be observed from *Table 6.10* below, the Low Self-DRS group had slightly higher severity symptom scores, which suggested somewhat higher risk for psychopathology, than the groups of Normal to High Self-DRS. The regression tests reported that categories of AD/HD Inattentive, AD/HD combined, Generalized Anxiety, Schizoid Personality Disorder, Schizophrenia, Dysthymia and Bipolar Disorder with Low Levels of Self-DRS had significantly higher severity scores than the Normal to High Levels of Self-DRS. The non-parametric test results were reported in *Table 6.18* in Appendix.

Furthermore, no significant gender effect was found either on DRS levels or on symptomatology *T scores* respectively, with the only exception of significant mean difference of boys ( $M=50.94$ ,  $SD=5.61$ ) and girls ( $M=46.77$ ,  $SD=6.51$ ) in the symptom category of Anorexia [ $F(1,156)=11.41$ ,  $p<.001$ ]. However, gender (Male vs. Female) and DRS Levels (Low vs. Normal-High) were found to have an interactional effect on some of the behavioural or emotional problems. The regression tests with clustered robust standard errors reported that, between the Lower DRS Levels and the Normal-High DRS Levels, there were significant mean differences of *T scores* of the CASI-4R for boys in AD/HD Inattentive [ $F(1,79)=5.53$ ,  $p=.02$ ] and AD/HD combined Disorder [ $F(1,76)=5.84$ ,  $p=.02$ ], whereas for girls in Generalized Anxiety [ $F(1,76)=4.38$ ,  $p=.04$ ],

Schizoid Personality Disorder [ $F(1, 76)=4.39, p=.04$ ], Dysthymia [ $F(1,76)=5.76, p=.02$ ] and Bipolar Disorder [ $F(1.76)=4.10, p=.04$ ]

**Table 6.10 Descriptive Statistics of Low Self-DRS and High Self-DRS in Relation to the Severity T Scores of CASI-4R and their Linear Regression Results Clustered by Family Units**

	Low Self-DRS		Normal to High Self-DRS		Regression Results (df=1,156)
	N	Mean(SD)	N	Mean (SD)	
AD/HD, Inattentive	61	54.72 (10.20)	250	52.06 (10.65)	$F=7.73, p=.006^{**}$
AD/HD, Hyper-Imp	62	52.03 (11.94)	250	50.69 (11.63)	$F=3.36, p=.07$
ADHD, Combined	61	53.93 (10.53)	248	51.58 (10.72)	$F=7.81, p=.006^{**}$
Conduct	62	50.06 (9.09)	252	48.78 (6.33)	$F=2.77, p=.098$
Antisocial PD	62	51.15 (11.62)	252	49.36 (9.52)	$F=2.82, p=.09$
Oppositional Defiant	62	56.16 (12.61)	252	54.52 (10.01)	$F=3.18, p=.08$
Generalized Anxiety	62	52.53 (11.12)	251	50.78 (10.20)	$F=4.65, p=.03^{*}$
Separation Anxiety	62	52.32 (13.10)	251	50.05 (11.17)	$F=.36, p=.55$
Schizoid Personality	62	53.65 (14.52)	252	48.90 (7.74)	$F=7.73, p=.006^{**}$
Schizophrenia	62	52.47 (12.31)	252	49.33 (4.83)	$F=4.30, p=.04^{*}$
Major Depression	62	48.16 (7.46)	251	47.58 (6.63)	$F=1.89, p=.17$
Dysthymia	62	52.31 (13.28)	252	49.71 (10.45)	$F=6.34, p=.01^{*}$
Bipolar	61	51.03 (11.28)	252	48.78 (8.07)	$F=6.43, p=.006^{**}$
Anorexia	61	51.28(13.05)	252	48.31 (8.43)	$F=3.50, p=.06$
Bulimia	60	51.70 (12.73)	252	49.23 (9.06)	$F=3.73, p=.06$

*\*\*.* Correlation is significant at the 0.01 level (2-tailed) *.\** Correlation is significant at the 0.05 level (2-tailed)

## 6.4 Discussion

The aim of this chapter is to test the discriminative validity and concurrent validity of the newly adapted CAI-DRS in a normative sample of 160 adolescent twin pairs. Specially, the differentiation-relatedness levels were examined to see whether they were independent of social-demographic variables such as gender, ethnicity and SES factors, and whether the CAI-DRS measure could be correlated to the two well-validated symptom inventory measures.



## **Normative Level of Mental Representation in Adolescence**

Within this adolescent sample, the levels of the differentiation-relatedness were in the range Level 2 to Level 8 with around half the sample scoring at Level 6. Overall, the differentiation-relatedness level of adolescent twins in this study could be characterized by moving from some rudimentary sense of a differentiated self and some recognition of other as separate with polarized and unintegrated images of self and other (Level 5) to a more differentiated and integrated representation of self and other (Level 6). At Level 6, there is an emergent, ambivalent constancy and cohesion of self and an emergent sense of relatedness to others, however unique characteristics of self or other are lacking at this level (see Appendix CAI-DRS manual). In addition, although not significant, the mean score for the differentiation-relatedness of self and other based on self-description level appeared to be higher than both the level of differentiation-relatedness of self-mother and of self-father. As the DRS measured on the self-description is a more generalized sense of differentiation-relatedness of self and others rather than relationship specific, the results may imply an emerged difference between mental representation of self and representations of self in relation with parents in adolescence that in part reflect the growing maturation of the representation of self or the consolidation of self-identity with increasing independence from parents during adolescence (Allen, 2008; Blos, 1962, 1979; Erikson, 1968).

The adolescent level of differentiation and relatedness in this study was lower than adult normative samples in previous empirical studies in which Level 6 was found to differentiate the norms from the psychiatric inpatients (e.g. Luyten et al., 2006). Here, two main characteristics of the study sample need to be addressed prior to attempts at generalizing the representational level of differentiation-relatedness for normative adolescents. First, the adolescents in this study were at proper mid-adolescent age of 15 years old ( $SD=.26$ , range 14.09-15.87) at the assessment time. The narrow age range of middle adolescence not only minimized potential individual developmental differences from latency or young adulthood, but also maximized the characteristics of adolescence for its remarked mourning for the lost infantile objects and longing for new relatedness outside of the family (Blos, 1962; Freud, 1958; Lewis, 1989). Lewis (1987, 1989) used Klein's concept and argued that the psychological stress of puberty causes a regression to the paranoid-schizoid position in early adolescence followed by a re-emergence of the depressive position in middle adolescence with vacillations between the two

positions in parallel with the process of object removal and shifts in adolescent's interpersonal activity. These characteristics of middle adolescence fit well with the representational level of differentiation-relatedness obtained from this study in which adolescents were moving from Level 5 representation of self or other dominated by polarization of experiences, and by oscillation between positive and negative representation of self or other, to Level 6 representation of self or other that was more modulated, integrated and stable but marked by a hesitant, equivocal or ambivalent movement towards this integration and stabilization.

### **Discriminative Validity of the CAI-DRS**

#### ***Gender***

In the discriminative validity part of this study, it was found that gender of the child did not affect the level of differentiation-relatedness, whether using parametric or non-parametric statistical tests. This result is consistent with previous findings in studies that little difference was found between males and females in their overall representation of attachment to each of the parents in adolescence (e.g. Armsden, McCauley, Greenberg, Burke, & Mitchell, 1990; Besser & Blatt, 2007; Ma & Huebner, 2008).

#### ***Cultural Variances***

In terms of cultural impact, there were some significant mean differences found among groups of children's ethnic origins in parametric tests. The Asian or Asian British Group was reported to have somewhat higher differentiation-relatedness levels than the other ethnic groups with only one exception, the Black or Black British on the differentiation-relatedness of self and mother. With reference to the predominant White or White British group in this study sample, the differentiation-relatedness level significantly differed from the Asian or Asian British group and from the Black and Black British group. However, the non-parametric results have only shown significant differences on the Father-DRS among different ethnic groups. Considering the sample size of the Asian or Asian British group and the Black or Black British Group was rather small in comparison to the White or White British Group in this study, the influences of cultural differences between predominant culture group and ethnic minorities could not be further interpreted before a validation study with a wider range

of ethnic groups. The results of the levels of mental representation of self and other found in this study could only represent the White or White British cultural group of adolescents with a mean score of 5.50 on Self-DRS (SD=1.34), 5.33 on Mother-DRS (SD=1.21) and 5.54 on Father-DRS (SD=1.13).

In addition, another interesting result on ethnicity in this study was that the Mixed ethnic group presented with general lower levels of differentiation-relatedness than all the other three ethnic groups, although not significantly. Apart from the possibility of measurement error or sampling error, one hypothesis for this result might be that the collision and merger of mixed culture of parents might have some effects on the child's development of a differentiated and consolidated self-identity during adolescence, as the continuing separation-individuation process further involves the development of a sense of self value entitled to social and cultural recognition and acceptance (see Blatt, 2008; Meissner, 2009; Sampson, 1988; Surrey, 1985). However, with the small sample size of mixed ethnic group, this hypothesis remains to be tested in future studies.

### ***SES Factors***

Common indicators of household income, parents' occupational status and parents' education levels were used to evaluate the socioeconomic status of adolescents and their families (Bradley & Corwyn, 2002; Currie et al., 2008; Ensminger & Fothergill, 2003). The results reported in this study suggested that household income in general did not have a significant effect on the adolescent's mental representation ( $r < .20$ ), nevertheless there was a mild almost negligible indication of positive correlations between household income and representation of self as well as the differentiation-relatedness of self and father. Regarding the employment status of the parents, the results suggested that mother's occupational status did not have any significant impact on adolescents' mental representations, however, father's occupational status significantly differentiated the levels of representation of self in particular. To be more specific, adolescents with Full-Time employed fathers were reported to have higher levels of mental representation of self and others than those with Part-Time employed fathers or Unemployed fathers. In other words, this study suggested that low occupational status of fathers may in part be associated with possible delay or impairment in the development of adolescents' self-representation, as the differentiation-relatedness mean scores indicated that the levels of

mental representation of self and others were even lower than the average normal level in middle adolescence (i.e. below Level 5). One hypothesis to interpret such link is whether occupational status of the father has an observable however indirect effect on adolescent's development of self-representation, as employment status is often reported to correlate with parental stress (Clark & Oswald, 1994) and mental health problems (Hudson, 2005). However, the effect of parental occupational status on mental representation of self and other in adolescence still remains for verification as the sample has a small percentage of PT employed and unemployed fathers.

The third indicator parental educational level was found to have no significant effect on adolescents' differentiation-relatedness level. Although no direct link could be drawn between SES factors and development of mental representation, the implication of mild impact of household income and fathers' occupational status on adolescent's levels of self-representation found in this study may be explained as secondary contributors to the development of mental representation of self. As suggested by a growing body of research evidence on SES in relation to child and adolescent development, social and economic situation of the family could have significant impact on the quality and stability of parents' relationships (Amato, Booth, Johnson, & Rogers, 2007; Karney & Bradbury, 1995), the relationships between parents and children (Conger & Conger, 2002), parenting (Hoff, Laursen, Tardif, & Bornstein, 2002) and child development (Conger, Conger, Matthews, & Elder Jr, 1999; Edin & Kissane, 2010), which may subsequently affect the child's development of representation of self and others.

### **Concurrent Validity of the CAI-DRS**

The results of concurrent validity of the CAI-DRS were less satisfactory. The differentiation-relatedness scale was reported to not correlate with the self-report Youth Inventory, and only the levels of representation of self showed some weak negative correlations with the mother-report Child Adolescent Symptom Inventory. Since both the YI-4 and the CASI-4R are well-validated symptom measures, possible explanations for the results might be attributed to the accuracy of the symptom reporting sources and the validity of measured differentiation-relatedness results in this sample. As illustrated in the results section, only low to moderate agreement was found between adolescents' self-report symptom results and mother-report symptom results. This discrepancy

between informants on children's behavioural and emotional problems was widely recognized by a range of studies (e.g. Achenbach, McConaughy, & Howell, 1987; Van Roy, Groholt, Heyerdahl, & Clench-Aas, 2010; Verhulst & Der Ende, 1992). It is expected that with the cognitive development and the change of parent-child relationship in adolescence, adolescent' self-report information becomes a more indispensable source of their own emotional and behavioural problems, whereas the reliability of parent-report problems decreases with the age of the child (Edelbrock, Costello, Dulcan, Kalas, & Conover, 1985; Paikoff & Brooks-Gunn, 1991). There is also evidence that suggests that adolescents with insecure attachment relationships, especially ones with dismissing attachment patterns, are more likely to report discrepant internalizing and externalizing symptoms from parent-report, as a result of distorted self-perception of symptoms as well as maladaptive communication of problems between parent and child (Berger, Allen, & Oltmanns, 2001; also see Allen, 2008). Although the study of Berger and colleagues (2001) could not draw definitive conclusions about whether insecure adolescents or their parents were the more inaccurate reporting sources, the findings highlighted the importance of taking into consideration potential inaccuracy of self-report and parent-report results of emotional and behavioural difficulties. Considering about half of the sample in this study was insecure adolescents (see Chapter 7), it was worth taking into account the possibility of inaccurate report of symptoms both from the adolescent's self-perspective and mother's perspective.

Another possible explanation of the poor correlations between the CAI-DRS and the results of the two symptom inventories was the limitation of the sample in this study. As mentioned in the results section, the study sample was a normative sample with very low risk severity scores and the differentiation-relatedness scores obtained were also in a narrow normal range, subsequently hardly any linear correlations could be formed on this basis. Following the indication of mild negative correlations between the levels of representation of self and mother-report symptom severity scores, it was found that in this study adolescents with above symptom criterion scores (i.e. clinical cut-offs) generally had lower levels of differentiation-relatedness of self and others than the non-clinical cut-offs in majority symptom categories. In particular, the level of self-representation was able to significantly differentiate adolescents that were classified as clinical subgroups in AD/HD Hyper-Impulsive, Social Phobia, and Dysthymia

Disorders from the non-clinical subgroups, despite the low risk range of severity symptom scores. Furthermore, individual's with lower levels of representation of self and others below Level 5 were found to have significantly higher risk for psychopathology of AD/HD Inattentive, AD/HD combined, Generalized Anxiety, Schizoid Personality Disorder, Schizophrenia, Dysthymia and Bipolar Disorders. Although with restrictions, this study in part supported the evidence that the differentiation-relatedness of self and others on self-description reflecting a more integrated and general representational structure of self and others was considered a relatively better variable than representations of self-mother or of self-father for assessing clinical functioning (e.g. Blatt, Stayner, et al., 1996; Luyten et al., 2006) and it was expected to be more sensitive to therapeutic changes (Blatt, Stayner, et al., 1996; Diamond et al., 1990; Philips et al., 2006). As the DRS demonstrated more salient results in previous studies for differentiating between psychiatric inpatients and normal controls (Luyten et al., 2006), between psychiatric and nonpsychiatric controls (Twomey et al., 2000), and levels of clinical functioning in seriously disturbed inpatient samples (Kaslow et al., 1998), future validity studies of the CAI-DRS might warrant more significant results in relation to psychological functioning in adolescence, providing samples with a wider range of risks for psychopathology.

In addition, some rudimentary interactional effects of gender and differentiation-relatedness levels on some psychopathologies were reported in this study, where boys with low levels of representation of self had significantly higher risks for externalizing problems of AD/HD Inattentive and AD/HD combined disorder, while girls with lower levels of representations of self had significantly higher risks for internalizing mood/anxiety problems of Generalized Anxiety disorder, Dysthymia and Bipolar disorders as well as personality disorder such as Schizoid Personality Disorder. Although the results were not conclusive enough, it indicated some tendency that boys with low mental representations levels were more likely to be associated with externalizing problems<sup>7</sup> (e.g. ADHD), whereas girls with low levels of self-representation were more likely to have internalizing problems (e.g. mood and anxiety disorder). In part, the results were consistent with previous findings that gender

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<sup>7</sup> The YI-4 and the CASI-4R do not cluster psychopathologies into "Externalizing" and "Internalizing" Syndromes like the Achenbach's Youth Self Report (YSR; Achenbach, 1991a). The terms used here refer to most widely replicated clusters where "Externalizing Disorders" include conduct disorder, oppositional defiant disorder, antisocial personality disorder, substance use disorder and in many studies, attention deficit hyperactive disorder, and "Internalizing Disorders" mainly refer to mood and anxiety disorders (see Hyman, 2011).

differences in the rates of externalizing and internalizing emerge in adolescence (Cohen et al., 1993; Fleming & Offord, 1990). A number of studies reported that boys were more likely to report externalizing symptoms and girls reported more internalizing symptoms in adolescence (e.g. Besser & Blatt, 2007; Cohen et al., 1993; Fleming & Offord, 1990; Lewinsohn et al., 1993; Whitley & Gridley, 1993; see Chapter 3 section 3.4).

## **6.6 Conclusion**

In conclusion, adolescents in this study were characterized by the levels of mental representations of self and others moving from semi-differentiation (Level 5) to an emergent, ambivalent constancy and an emergent sense of relatedness (Level 6), which is consistent with characteristics of middle adolescence in normative development model. In terms of discriminative validity, the results of this chapter showed that levels of Differentiation-Relatedness obtained from the CAIs were overall independent of demographic factors such as gender as well as the socioeconomic factors. With respect to ethnicity, the results indicated some minor impact of cultural variations especially between the predominant culture group and ethnic minorities. However, no conclusions of cultural impact could be drawn due to the small number of families in the ethnic minority range. As reviewed in Chapter 1, Section 1.4.3, a variety of social and cultural factors can influence issues of self-definition and interpersonal relatedness in personality development. It is thus important to have further studies with a wider range of ethnic groups to investigate the influences of social-cultural environment on the representation of self and other. The concurrent validity was less satisfactory mainly due the limitations of the sample in this study. However, the self-representation in particular appeared to be a relatively more significant variable in relation to psychopathology than the representations of parents. Lower levels of self-representation were found to be more likely to associate with higher risk for psychopathology, especially in symptoms of AD/HD Inattentive, AD/HD combined, Generalized Anxiety, Schizoid Personality Disorder, Schizophrenia, Dysthymia and Bipolar Disorders. In addition, there was limited but some indication of emerged gender differences in internalizing and externalizing disorders in adolescence. Following the discriminative and concurrent validity of the CAI-DRS, the next chapter aims to examine the

convergent validity between the CAI-DRS and the Child Attachment Interview measures.



## **Chapter 7 Convergent Validity: the CAI-DRS and the Child Attachment Interview**

### **7.1 Introduction**

It is particularly crucial to investigate the mental representation of self and other in adolescence considering that the drastic changes and challenges at the adolescent stage have crucial influences on children's subsequent development in later adult life. In comparison to low or modest continuities of attachment patterns from infancy to adolescence (e.g. Becker-Stoll et al., 2008; Weinfield et al., 2004), attachment representations that are formed during late childhood and early adolescence were found to become more stabilized over time (Allen et al., 2004; McCormick & Kennedy, 1994). Therefore, the middle to late adolescence becomes a crucial stage in which to investigate the development of mental representations which have the potential to significantly influence individual's developing state of mind in relation to attachment as well as self-identity in the future adulthood. In normal development, one of the primary tasks in adolescence is widely recognized to be self-identity consolidation with increasing autonomy and growing independence from parents (see Chapter 3). However, as emphasized in attachment theory and research, the maintenance of warm, positive relationships with parents is equally important as the process of separation and individuation (Allen, 2008; Collins & Repinski, 1994; Fraley & Davis, 1997; Kenny, 1994; Schultheiss & Blustein, 1994; Steinberg, 2001). Extensive research findings, especially in attachment studies, have found substantial supporting evidence that secure attachment to parents facilitates the separation and individuation developmental process in adolescence (Ryan & Lynch, 1989; Ryan, Stiller, & Lynch, 1994; Toth & Cicchetti, 1996). Within the context of strong secure attachment bonds with parents, adolescents are able to freely explore the world with emotional and cognitive independence. Conversely, over-dependency or premature detachment from parents can lead to impairments in developing a stable and positive self-identity (Marcia, Waterman, Matteson, Archer, & Orlofsky, 1993; Meeus, Oosterwegel, & Vollebergh, 2002). For instance, enmeshed or overpersonalized parent-child interactions were found to undermine the separation-individuation process and were more likely to be associated with attachment insecurity (Allen & Hauser, 1996; Dozier & Kobak, 1992), as the child's attempt to establish autonomy becomes a threat to the current parent-child

relationship. In short, a balance between autonomy and supportive, mutually trusting relatedness with parents in adolescence has been found to be associated with more positive developmental outcomes such as positive self-esteem, ego development, ego resiliency, peer relationship competence and educational attainment (Allen et al., 1994; Freitag, Belsky, Grossmann, Grossmann, & Scheuerer - Englisch, 1996; Kobak & Sceery, 1988).

As reviewed in Chapter 2, attachment theory and research have contributed significantly to understanding the early experiences of mother-infant relationship and their life-long implications on personality development and emergence of psychopathology. However, there are still certain limitations of attachment theory and research studies (see Chapter 2, Section 2.3). In particular, the classifications of prototypical attachment patterns are primarily defined on the basis of attachment quality (Bartholomew & Horowitz, 1991) and appear rather broad and static with little developmental differences acknowledged in the structure of the Internal Working Models (Blatt & Levy, 2003). The conceptualization of limited attachment prototypes is one of the difficulties that arises in attempts to reconcile insecure attachment representations and psychopathology (Dozier et al., 2008) and furthermore, the categories are also too general to permit the development of a model that may generate specific treatment (Rutter & O'Connor, 1999). Therefore, Blatt and his colleagues' formulations of psychoanalytic and social cognitive development of mental representations (Blatt & Blass, 1992; Blatt & Levy, 2003; Bretherton, 1999; Levy & Blatt, 1999; Levy et al., 1998) can benefit the understanding of the IWMs in attachment theory by elaborating and articulating a more developmental, intricate and sophisticated perspective of various different levels of personality functioning among and within insecure attachment patterns and further providing a more continuous psychodynamic framework for establishing further continuities between attachment patterns, personality development and psychological disturbances (see Chapter 2, Section 2.4).

With the integrative framework between the polarities model and attachment, secure attachment can be viewed as a well-balanced integration of the two fundamental developmental dimensions of interpersonal relatedness and self-definition as a result of the synergistic dialectic transactions in normal personality development (Blatt & Levy, 2003; Mikulincer & Shaver, 2007). Severe disruptions in the dialectic transactions of

interpersonal relatedness and self-definition, at different developmental levels, can lead to distorted or exaggerated preoccupation of one dimension at the expense of the other (see Chapter 1). This defensive preoccupation of relatedness or of self-definition is consistent with the differentiation between the two major insecure attachment patterns of the Preoccupied (Ambivalent/Resistant) and the Dismissing (Avoidant) attachment patterns (e.g. Ainsworth et al., 1978; Bartholomew & Horowitz, 1991; Hazan & Shaver, 1987; Main et al., 1985; West & Sheldon, 1988). Within the polarities model, the preoccupied attachment pattern can be viewed as an exaggeration and distortion in the developmental line of interpersonal relatedness at the expense of the development of self-definition and the dismissing attachment pattern can be linked to disturbances in the developmental line of self-definition at the expense of the relatedness dimension (Blatt & Homann, 1992; Blatt & Maroudas, 1992; Levy et al., 1998; Pilkonis, 1988; Zuroff & Fitzpatrick, 1995). Furthermore, developmental levels of mental representations have also contributed tremendously in differentiating different levels of functioning within each insecure attachment pattern and further linking to distinctive maladaptive psychological functioning (see Chapter 2, Section 2.4).

Adolescence is a particularly crucial developmental stage for investigating the mental representations considering that the drastic changes and challenges at the adolescent stage have the potential to significantly influence individual's developing state of mind with respect to attachment in the future adulthood (see Chapter 3, Section 3.2). In normal development, one of the primary tasks in adolescence is widely recognized to be self-identity consolidation with increasing autonomy and growing independence from parents (Blos, 1962; Deutsch, 1944; Erikson, 1968; Freud, 1905). However, the maintenance of warm, positive relationships with parents is equally important as the process of the separation and individuation (Allen et al., 2004; Allen et al., 2003; Dozier & Kobak, 1992; Ryan & Lynch, 1989). In a way, autonomy in adolescence is achieved on the basis of maintaining the balance between self-definition and interpersonal relatedness. In fact, as reviewed extensively in Chapter 3, Section 3.2, the key to resolving the developmental tension between autonomy and attachment during adolescence is dependent on the process of re-negotiation of the child's role in the family taking into account the adolescent's growing independence, which involves both the adolescent's capacity to reconstruct the attachment relationships as they adjust to the cognitive, emotional and social changes and at the same time the parents' ability to

adapt to a changing role of providing a secure basis according to the adolescent's current needs (Dubois-Comtois, Cyr, et al., 2013; Rosenblum & Lewis, 2003). In other words, the adolescent's ability to maintain the balance between self-definition and interpersonal relatedness is not only influenced by their internalized experiences of interpersonal relationships and self prior to the adolescent age, it is also influenced by the quality of their current relationships with their parents as well as the parents' mental capacity to adapt to the child's drastic developmental changes (see Chapter 3, Section 3.2).

Attachment theory and research has contributed extensively to the understanding of adolescent development and psychopathology (e.g. Allen, 2008; Allen et al., 1998; Leadbeater et al., 1999; van Ijzendoorn & Bakermans-Kranenburg, 1996), nevertheless, there are certain limitations in current studies. Prior research studies on mental representations in adolescence have largely emphasized the centrality of the adolescent's mental representations of parents or the quality of earlier or current attachment relationship in relation to symptoms or level of psychological adjustment (see Chapter 3, Section 3.4). However, there is sparse empirical work on children's mental representations of self in adolescence, despite extensive emphasis on self in the literature and its pivotal position in understanding personality development and subjective experiences of patients in adulthood (e.g. Auerbach & Blatt, 1996; Bers et al., 1993; Rangell, 1982; Tuttleman, 1988). The lack of research into self-representation in adolescence might be due to lack of appropriate assessment measures or the assertion that measures evaluating a separate construct of self-representation from relational schemas are redundant or invalid prior to adulthood (see Chapter 2, Section 2.2.1). As adolescents are developing towards an integrated mind regarding both primary attachment figures around late adolescence and young adulthood (see Furman & Simon, 2004) as well as integrating past and present attachment experiences (Allen, 2008), and expanding working models of diverse relationships (Furman et al., 2002), the assessment of representation of self might become increasingly important in adolescence, as the self-representation will not only reflect an increasingly differentiated and consolidated self-identity, but also a more general mental state of relatedness rather than relationship-specific representations.

This chapter aims to test convergent validity between the CAI-DRS and the child attachment Interview measure. The study has examined the level of mental representations in a sample of adolescent twins within the context of their current attachment relationships with parents. The representation of self and representations of self and significant others were compared across different attachment patterns. Twin relationships were also investigated by looking at the impact of attachment patterns on the individual's perceptions of the twin relationship as well as the effect of twin's attachment pattern on the co-twin's mental representation of self. Furthermore, the convergent validity of the newly adapted CAI-DRS was tested in relation to the attachment measure of Child Attachment Interviews. In addition, the associations with symptoms of psychopathology were compared between levels of mental representation of self and attachment security.

## **7.2 Method**

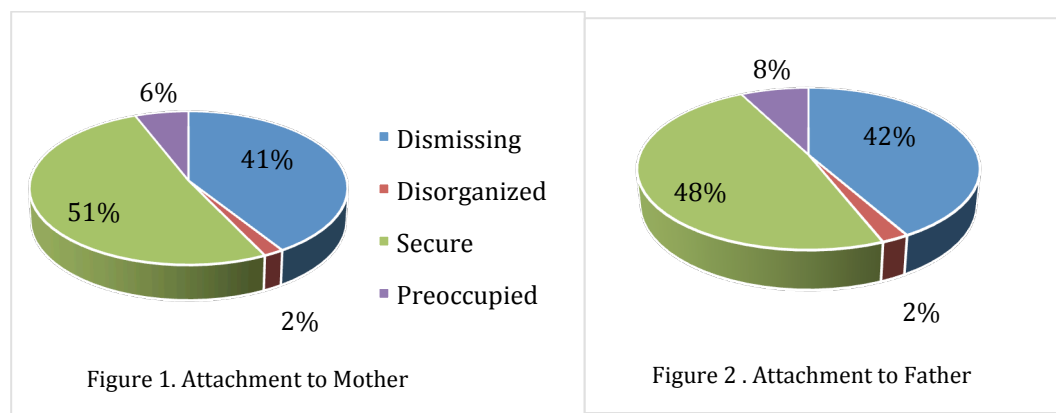
### **7.2.1 Measures**

#### ***The Child Attachment Interview***

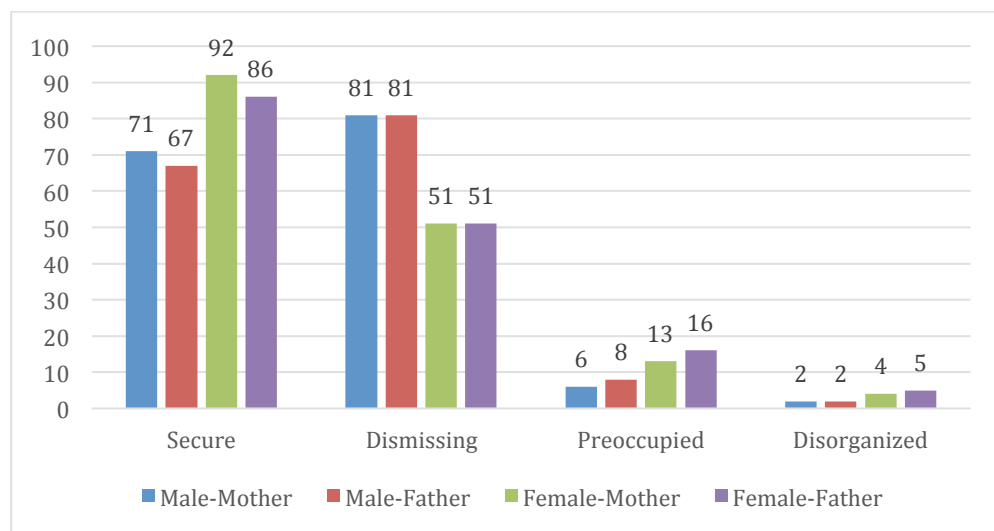
Overall, the valid interview coding in this study for attachment was 316 for father and 320 for mother. The four cases of missing data on attachment to biological father were due to the loss of, or separation from, the father at a very young age. Within the classification with mother, 163 adolescents were securely attached, 132 of which were dismissing, 19 were preoccupied and 6 were disorganized. In the total of 316 attachment to father cases, 153 were classified as secure, 132 as dismissing, 24 as preoccupied and 7 as disorganized. The distributions of attachment patterns are presented below in *Chart 7.1*. The two-way classification of secure/insecure attachment to mother was highly concordant with the attachment patterns with father, with 98.01% agreement rate (N=314). The four-way attachment classification concordance between parents was 93.3%. Furthermore, as shown below in *Chart 7.2*, both for boys and girls, there were no observable differences between attachment to mother and attachment to father. However, there were significant gender differences within attachment patterns, especially comparing the Secure and the Dismissing attachment patterns [AF-Mother:  $\chi^2(3)=12.77$ ,  $p=.005$ ; AF-Father:  $\chi^2(3)=13.13$ ,  $p=.004$ ]. For attachment to parents in

general, there were 43.1% of boys classified as Secure, 50.6% as Dismissing, 4.3% as Preoccupied and 1.3% as Disorganized; for girls, a majority of 55.6% were Secure, 31.9% were Dismissing, 9.1% were Preoccupied and 4.3% were Disorganized. Overall, girls were reported to be more Secure than Dismissing compared to boys whereas more boys were classified as Dismissing than Secure in comparison to girls. In addition, no significant differences of secure and insecure attachment patterns were found between identical and fraternal twins [ $\chi^2(1)=.11$ ,  $p=.74>.05$ ].

**Chart 7.1 the Distribution of Four-Way Attachment Patterns**



**Chart 7.2 Gender and Attachment to Parents**



### ***CAI-DRS***

In the sample of this study (N=320), the overall mean score of DRS on self-description was 5.53 (SD=1.30), which was slightly higher than the mean scores of the DRS on description of the relationship with mother (M=5.33, SD=1.21) and on descriptions of the relationship with father (M=5.42, SD=1.15). The Self-DRS correlated moderately with the Mother-DRS ( $r=.56$ ) and the Father-DRS ( $r=.49$ ) at the significance level  $p<.001$ . As a comparison, the correlation between the Mother DRS and Father-DRS was stronger ( $r=.64$ ,  $p<.001$ ).

### **7.2.2 Data Analysis**

As reported in previous attachment research, some studies did not find systematic differences in quality of attachment to mother as compared to quality of attachment to father (Lapsley, Rice, & FitzGerald, 1990; McCormick & Kennedy, 1994), whereas others have found significant differences between attachment to mother and father (Cubis, Lewin, & Dawes, 1989; Pipp, Shaver, Jennings, Lamborn, & Fischer, 1985). Therefore, in this chapter, the attachment relationship to mother and the attachment relationship to father were examined separately considering that attachment relationships are relationship specific (Ainsworth, 1982; Asendorpf, Banse, Wilpers, & Neyer, 1997; Bretherton, 1985; McCormick & Kennedy, 1994) and children in middle adolescence may or may not yet have developed an integrated state of mind with respect to attachment as expected by adulthood (e.g. Furman & Simon, 2004).

The statistical analyses of the study include three parts. In the first part, the score of the DRS were examined in relation to adolescents' attachment patterns to their parents. Mean differences of the Self-DRs, the Mother-DRs and the Father-DRs respectively were compared between the Secure-Insecure two-way classifications as well as among the four-way classifications of Secure, Dismissing, Preoccupied and Disorganized attachment patterns. Linear regression tests were used to compare the mean differences among different attachment groups.

In the second part of the result section, the convergent validity of the CAI-DRS was tested with all the dimensional subscales of the CAI. In particular, the Coherence scores that indicating levels of attachment security were emphasized in relation to the DRs.

Furthermore, the relationship between psychopathology and the CAI was also compared to previous finding of the DRs on the CASI-4R in Chapter 6 in order to differentiate the correlations among mental representations of self and others, attachment patterns, and psychopathology. Both the first part and the second part of the analyses were examined as the degrees of the convergent validity of the CAI-DRS in relation to the Child Attachment Interview measure.

In the last part, the twin reference scale and the quality of twin relationship scale of the CAI-DRS in relation to individual's attachment patterns were examined as the effect of twin relationship. Moreover, the twin relationship was explored by examining the potential effect of co-twin's attachment patterns to parents on the twin's differentiated-relatedness levels of self (i.e. the Self-DRS). All the statistical analyses in this study were conducted using linear regression model with clustered robust standard errors in Stat.

## **7.3 Results**

### **7.3.1 DRs within the Two-way and the Four-way Attachment Classification**

The descriptive statistics of the DRS on secure/insecure two-way classifications with both parents were summarized in the *Table 7.1* above. As can be observed, the Self-DRs were overall higher than the Mother-DRS and the Father-DRS, and the DRS of securely attached adolescents were higher (approximate level 6) than those with insecure attachment relationships (approximate level 5). Further examined by a series of linear regression tests with clustered robust standard error, there were significant mean differences between the secure and insecure attachment with mothers on the scale of the Self-DRs [ $F(1,159)=36.72, p<.001$ ], the Mother-DRs [ $F(1,159)=53.73, p<.001$ ] and the Father-DRs [ $F(1,158)=45.27, p<.001$ ]. Similar results were also found on the DRs in relation to the attachment relationship with fathers. The Self-DRs [ $F(1,158)=43.72, p<.001$ ], the Mother-DRs [ $F(1,158)=47.40, p<.001$ ] and the Father-DRs [ $F(1,158)=45.72, p<.001$ ] were reported to significantly differentiate between secure and insecure attachment relationships with father respectively.



**Table 7.1 Descriptive Statistics for DRs within Two-Way Classification**

		Attachment with Mother		Attachment with Father	
		Secure	Insecure	Secure	Insecure
Self-DRs	Mean (SD)	5.95 (1.00)	5.09 (1.42)	6.00 (.97)	5.09 (1.41)
Mother-DRs	Mean (SD)	5.80 (1.00)	4.85 (1.21)	5.80 (1.03)	4.89 (1.21)
Father-DRs	Mean (SD)	5.83 (1.05)	4.99(1.10)	5.85 (1.05)	5.02 (1.10)

**Table 7.2 Statistical Summary of the DRS for the Four-Way Attachment Classifications with Mother (N=320)**

		Attachment to Mother			
		Secure	Dismissing	Preoccupied	Disorganized
Self-DRs	Mean (SD)	5.95 (1.00)	5.05 (1.45)	5.68 (.89)	4.17 (1.72)
Mother-DRs	Mean (SD)	5.80 (1.00)	4.85 (1.23)	5.21 (1.03)	4.67 (1.51)
Father-DRs	Mean (SD)	5.83 (1.05)	5.06 (1.06)	5.00 (1.11)	3.50 (1.23)

**Table 7.3 Statistical Summary of the DRS for the Four-Way Attachment Classifications with Father (N=316)**

		Attachment to Father			
		Secure	Dismissing	Preoccupied	Disorganized
Self-DRs	M (SD)	6.00 (.97)	5.06 (1.41)	5.58 (1.06)	3.86 (1.77)
Mother-DRs	M (SD)	5.80 (1.03)	4.83 (1.23)	5.33 (.96)	4.43 (.96)
Father-DRs	M (SD)	5.85 (1.05)	5.05 (1.05)	5.17 (1.13)	3.86 (1.35)

Table 7.2 and 7.3 presented the statistical summaries of the three DRS scores of the four-way attachment classifications. The Self-DRS were overall higher than the Mother-DRS and Father-DRS, except for the Disorganized Attachment group in which the Mother-DRS were relatively higher. For both the attachment relationships with mother and father, the DRS scores of securely attached individuals were all close to the level of 6, which were observantly higher than those of the three insecure attachment patterns. Within the three insecure attachment patterns, DRS scores of the Preoccupied attachment patterns were the highest among the three, followed by the Dismissing attachment pattern with differentiation-relatedness levels close to 5. The DRS of the Disorganized attachment pattern were overall to be the lowest comparing to the other patterns and the differentiation-relatedness levels were around 4. The mean differences

among each attachment patterns were further tested by linear regression tests by family units. It was reported that the means of the Self-DRS scores differ significantly among the four attachment patterns with mother [ $F(3, 159)=13.04, p<.001$ ] as well as among the attachment patterns with father [ $F(3, 158)=16.44, p<.001$ ]. Similar results were found with the mean scores of the Mother-DRS and the Father-DRS. The Mother-DRS differentiated the four attachment groups significantly both within the attachment relationship with mother [ $F(3, 159)=17.89, p<.001$ ] and with father [ $F(3, 158)=17.50, p<.001$ ]. The mean scores of the Father-DRS were also reported with significant differences among the four attachment relationships with mother [ $F(3, 158)=19.35, p<.001$ ] and with father [ $F(3, 158)=18.66, p<.001$ ].

Following the significant results of regression tests, Post-Hoc Tukey tests were performed to compare all the means of the DRs within each of the attachment groups. The multiple comparison results were reported in the *Table 7.4* below. It can be observed from the *Table 7.3* and *Table 7.4* together that securely attached participants overall had significantly higher DRS scores than the other insecurely attached groups. However, the Self-DRS did not differentiate between the Secure attachment from the Insecure-Preoccupied attachment. Among the insecure attachment groups, the mean differences of the DRs were less significant especially between Dismissing attachment and Disorganized attachment.

**Table 7.4 Multiple Comparisons Results of Post-Hoc Tukey HSD among Four-Way Attachment Classifications**

		Attachment to Mother				Attachment to Father			
IVs		S	D	P	U	S	D	P	U
Self-DRs	Secure	-	.00	.21	.01	-	.00	.07	.00
	Dismissing	.00	-	.01	.18	.00	-	.04	.06
	Preoccupied	.21	.01	-	.03	.07	.04	-	.01
	Disorganized	.01	.18	.03	-	.00	.06	.01	-
Mother-DRs	Secure	-	.00	.02	.01	-	.00	.03	.00
	Dismissing	.00	-	.11	.18	.00	-	.03	.39
	Preoccupied	.02	.11	-	.03	.03	.03	-	.07
	Disorganized	.05	.81	.38	-	.00	.39	.07	-
Father-DRs	Secure	-	.00	.00	.01	-	.00	.01	.00
	Dismissing	.00	-	.82	.18	.00	-	.65	.02
	Preoccupied	.00	.82	-	.03	.01	.65	-	.02
	Disorganized	.00	.00	.01	-	.00	.02	.02	-

*S=Secure; D=Dismissing; P=Preoccupied; U=Disorganized*

### 7.3.2 The Effect of Attachment on Twin Relationships

In addition to the DRS scores of the CAI-DRS, the Twin Reference scores and the Twin Relationship Quality scores of the CAI-DR scale were also examined in relation to the attachment classification groups. As can be seen from the *Table 7.5* below, adolescents with secure attachment relationship had appropriate reference of the other twin (score of 5) in the interview narratives and relatively more positive twin relationships. Individuals with dismissing attachment relationships had lower reference of the other twin and appeared to have more neutral or reserved twin relationships, whereas the ones with preoccupied attachment relationships had a tendency to over-reference of the co-twin (score close to 6) but had slightly more negative twin relationships. The Disorganized groups had twin reference scores that were in the standard range, which was close to Level 5 and the relationship quality of the twins was reported to be the worst compared to the other attachment patterns. Linear regression tests followed by a Post-hoc test were further performed to examine the degree to which the scale of twin reference could differentiate among the four attachment groups. It was reported that there were significant mean differences of twin reference among the attachment relationships with mother [ $F(3,159)=9.30, p<.001$ ] as well as with father,  $F(3,158)=7.80, p<.001$ ]. Only the Disorganized attachment group did not differ significantly from other attachment groups in terms of the degree of reference of the co-twin in the interview.

**Table 7.5 the Attachment Patterns and the Twin Relationship**

	Attachment to Mother			Attachment to Father		
	N	Twin Reference Mean (SD)	Quality <sup>1</sup> Mean (SD)	N	Twin Reference Mean (SD)	Quality <sup>1</sup> Mean (SD)
Secure	163	5.03 (.94)	5.86 (1.27)	153	5.04 (.92)	5.87 (1.29)
Dismissing	132	4.55 (1.11)	5.15 (1.49)	132	4.57 (1.18)	5.11 (1.50)
Preoccupied	19	5.84 (1.21)	4.42 (1.50)	24	5.58 (1.10)	4.79 (1.50)
Disorganized	6	5.00 (1.41)	3.50 (.84)	7	4.86 (1.21)	4.00 (1.15)

<sup>1</sup> *Quality of Twin Relationship*

**Table 7.6 Post hoc Test of the Twin Reference Score among Attachment Groups**

	Attachment with Mother				Attachment with Father			
	Secure	Dismissing	Preoccupied	Disorganized	Secure	Dismissing	Preoccupied	Disorganized
B	-	.00	.01	.95	-	.00	.02	.67
A	.00	-	.00	.41	.00	-	.00	.52
P	.02	.00	-	.16	.01	.00	-	.13
D	.67	.41	.16	-	.67	.52	.13	-

(B=secure, A=Dismissing, P=Preoccupied, D=Disorganized)

Furthermore, in order to test whether individual twin's attachment relationship to parents could have an effect on the co-twin's differentiation-relatedness level, individual twin's Self-DRS was compared in relations to the co-twin's secure/insecure attachment patterns. For the reason that the secure/insecure attachment patterns to mothers and to the fathers were highly concordance, the results were only reported based on twins' attachment relationships with mothers here. As shown below in *Table 7.7*, for DZ twins, co-twin's attachment pattern did not have a significant effect on the other twin's differentiation-relatedness levels of self and others. For MZ twins, twins were reported to have higher levels of mental representations of self when the co-twins had secure attachment relationships with mothers compared to those whose co-twins were insecurely attached. However, results were only significant on Twin 1's Self-DRS [ $F(1,78)=7.22$ ,  $p<.01$ ], not on Twin 2's Self-DRS [ $F(1, 78)=3.38$ ,  $p=.07$ ]. Therefore, no conclusions could be drawn at this stage about whether co-twin's attachment pattern could have a significant effect on MZ twin's mental representations of self.

**Table 7.7 Statistics of the Twin's DRs in relations to the Co-Twin's Attachment Patterns**

	Twin 1 Self-DRs		Twin 2 Self-DRs	
	N	Mean (SD)	N	Mean (SD)
MZ Co-twin Secure	40	5.65 (1.03)	43	5.74 (1.05)
MZ Co-twin Insecure	40	4.85 (1.58)	37	4.68 (1.51)
Regressions	$F(1,78)=7.22$ , $p=.009^*$		$F(1,78)=3.38$ , $p=.07$	
DZ Co-twin Secure	39	5.62 (1.35)	41	5.76 (1.24)
DZ Co-twin Insecure	41	5.51 (1.50)	39	5.74 (1.14)
Regressions	$F(1,78)=.00$ , $p=.96$		$F(1,79)=.10$ , $p=.75$	

### 7.3.3 Convergent Validity between the CAI-DRS and the CAI

The relationship between the CAI-DRS items and the CAI items were summarized in the correlation matrix below in *Table 7.8*. For the overall items of emotional openness, positive/negative balance, use of examples, resolution of conflict and coherence, there were significantly positive correlations with moderate coefficients. Idealizing and Dismissing scores were in general found correlated negatively with the CAI-DRS items. It should be noted that the correlations between item of idealizing in the CAI and CAI-DRS scale were relatively weak. Preoccupied Anger with Mother and Preoccupied Anger with Father did not correlate significantly with most of the CAI-DRS items, nevertheless there was an overall pattern of negative relationship. In particular, significant correlations were found between quality of self-mother (C6) and Preoccupied Anger with Mother ( $r=.25$ ), and between quality of self-father (C9) and Preoccupied Anger with Father ( $r=.34$ ). In other words, the preoccupied anger items of the CAI were associated with the quality of corresponding relationships that measured in the CAI-DRS. The Preoccupied-Morbid appeared to be the weakest item in relation with the CAI-DRS scales. No particular relationship pattern was found. In particular, linear regression tests were performed to examine the relationship between the coherence scale of the CAI and the DRS. The regression results showed that the coherence scores predicted the Self-DRS significantly. It indicated that 18% of the coherence score can be explained by the Self-DRS ( $r=.43$ ,  $p<.001$ ). The Self-DRS was positively correlated with coherence and the relationship was moderate. Similar results were found with the Mother-DRs ( $r=.44$ ,  $r^2=.20$ ,  $p<.001$ ) and the Father-DRS ( $r=.41$ ,  $r^2=.16$ ,  $p<.001$ ).

**Table 7.8 Correlation Matrix for CAI-DRS scale and Child Attachment Interview Scale (N=320)**

	C2	C3	C4	C5	C6	C7	C8	C9	C10	C12
EO	.47**	.41**	.44**	.46**	.38**	.47**	.48**	.35**	.39**	.21**
Balance	.34**	.28**	.30**	.42**	.32**	.40**	.43**	.33**	.40**	.27**
Example	.50**	.38**	.47**	.51**	.39**	.48**	.48**	.36**	.40**	.22**
Conflict	.33**	.30**	.27**	.41**	.37**	.35**	.37**	.38**	.33**	.26**
Coherence	.45**	.41**	.43**	.49**	.39**	.44**	.48**	.40**	.41**	.29**
Anger-M	-.03	-.07	-.02	-.001	-.25**	-.05	-.05	-.14*	-.09	-.23**
Morbid-M	.06	-.08	.001	-.05	-.08	.01	.07	-.03	-.04	-.07
Ideal-M	-.16**	-.13**	-.11**	-.18**	-.09	-.25**	-.18**	-.14**	-.19**	.07
Dismissing-M	-.38**	-.33**	-.36**	-.39**	-.33**	-.40**	-.40**	-.26**	-.32**	-.30**
Anger-F	-.02	-.14*	-.03	-.07	-.12*	-.06	-.06	-.34**	-.09	-.14*
Morbid-F	.09	-.02	.06	.02	.03	.07	.09	-.07	.02	-.01
Ideal-F	-.13*	-.08	-.11	-.12*	-.17**	-.24**	-.17**	-.01	-.21**	-.06
Dismissing-F	-.39**	-.31**	-.38**	-.38**	-.30**	-.40**	-.39**	-.29**	-.34**	-.28**

*EO=Emotional Openness; Balance=Balance of Positive/negative references to Attachment Figures; Example=Use of Examples; Conflict=Resolution of Conflict; Coherence=Overall Coherence; Anger-M=Preoccupied Anger with Mother, Anger-F=Preoccupied Anger with Father; Morbid-M= Morbid Preoccupation with Mother, Morbid-F=Morbid Preoccupation with Father; Ideal-M= Idealizing of Mother, Ideal-F=Idealizing of Father; Dismissing-M=Dismissal and/or Derogation of attachment with Mother; Dismissing-F=Dismissal and/or Derogation of attachment with Father; C2, C5, C8=articulation of self or other; C3,C6,C9,C12=self regard or quality of self-other; C4,C7,C10=DRs*

In order to clarify the correlations between CAIs and CAI-DRS further, the relationships between CAI attachment measures and symptom inventory CASI-4R were also examined. As reported in the Table 7.9 below, within most of the symptom categories, adolescents with secure attachment relationships did not differ significantly from the ones with insecure attachment. Adolescents that securely attached to mothers were reported to differentiate significantly from the insecure ones on severity scores of Schizoid Personality Disorder, Schizophrenia and Bipolar Disorder. Similar results were found in relation to the attachment relationships with fathers, with two more additional symptom categories of Eating Disorders (i.e. Anorexia and Bulimia). In comparison, the Self-DRs (Low vs Normal-High levels) was reported to differentiate the groups AD/HD Inattentive, AD/HD combined, Generalized Anxiety Disorder, Schizoid Personality Disorder, Schizophrenia, Dysthymia and Bipolar Disorder. Furthermore, the correlations between CAI overall coherence scores and the severity *T scores* of the CASI-4R were only significant in the categories of Schizoid Personality Disorder ( $r=-.23$ ,  $p<.001$ ) and Schizophrenia ( $r=-.15$ ,  $r<.001$ ). As previously illustrated in Table 6.8 (Chapter 6) and Table 7.8 above, despite of the moderate correlation between the Self-DRs and the CAI coherence score ( $r=.41$ ), the Self-DRs differed from

the attachment Coherence score in relations to the CASI-4R severity scores. The Self-DRs were reported overall to have relatively stronger correlations with the CASI-4R *T scores*. Besides the two symptom common categories of Schizoid Personality Disorder and Schizophrenia, the correlations between the Self-DRs and the CASI-4R were also significant on categories of AD/HD Inattentive, AD/HD combined, Conduct Disorder, Antisocial Personality Disorder, Oppositional Defiant, Generalized Anxiety, Dysthymia and Anorexia.

**Table 7.9 Regression Results of Mother-Report CASI-4R T Scores between Secure/Insecure Two-Way Attachment Classifications and Correlations between CAI Coherence and T scores (N1=157 family clusters; N2=156)**

	Secure-insecure		Secure-Insecure		Correlation
	regression (df=1,156)	N1 p	regression (df=1,155)	N2 p	
<u>CASI-Mother</u>					
AD/HD, Inattentive	1.37	.24	1.33	.25	-.09
AD/HD, Hyper-Imp	.51	.48	.53	.47	-.08
ADHD, Combined	1.12	.29	1.13	.29	-.10
Conduct	2.17	.14	2.65	.11	-.09
Antisocial PD	3.66	.06	3.45	.07	-.10
Oppositional Defiant	1.34	.25	1.14	.29	-.07
Generalized Anxiety	1.18	.28	1.38	.24	-.04
Separation Anxiety	1.67	.20	2.96	.09	-.06
Schizoid Personality	9.93	.002**	9.46	.003**	-.23**
Schizophrenia	5.73	.02*	5.67	.02*	-.15**
Major Depression	.09	.76	.16	.69	-.004
Dysthymia	1.52	.22	1.19	.17	-.08
Bipolar	4.35	.04*	4.83	.03*	-.09
Anorexia	3.30	.08	4.54	.03*	-.10
Bulimia	2.78	.098	4.05	.046*	-.09

\*\**. Correlation is significant at the 0.01 level (2-tailed)*

\**. Correlation is significant at the 0.05 level (2-tailed)*

## 7.4 Discussion

The primary aim of this chapter was the convergent validity of the CAI-DRS. This includes whether the DRS corresponds to both attachment classifications and dimensional scale of the Child Attachment Interview measure. As the CAI and the CAI-DRS are separate measures with independent coding procedures and different coder, this study also has examined whether the attachment patterns of adolescents could have an effect on their developmental levels of mental representation of self, of self and mother, of self and father, as well as a subsequent impact on twin's relationship and co-twin's mental representation of self.

### **Attachment Classifications in Adolescence**

According to the results in this sample, it was found that the predominant attachment patterns of adolescent twins were Secure (app. 50%) and Insecure-Dismissing (app. 40%). For individual adolescent, the attachment relationship to the mother and attachment to the father were highly concordant with 98% agreement rate on secure-insecure two-way classification, and approximate 93% for four-way classification. The high concordance between the attachment relationships with the parents indicated very little difference in children's attachment to each of their parents in adolescence, despite evidence from some previous studies which suggested that, at least in Western culture, the mother tended to be the preferred attachment figure in the attachment hierarchies (Lamb, 1978; Lytton, 1980), especially for younger children and early adolescence (Buist et al., 2002; Ma & Huebner, 2008). Combined with the results that the differentiation-relatedness level of self and others (i.e. mental representation of self) was reported relatively more advanced than the levels of differentiation-relatedness of self-mother and self-father (i.e. the mental representations of parental figures), this may in part reflect adolescent's capacity to think of attachment in a more general way beyond any single relationship (Allen, 2008), and the psychological mechanisms shift from internalization and identification to integration in the process of constructing a consolidated self-identity (Blatt & Blass, 1996; Erikson, 1968). In a way, this assumption is also supported by the behavioural-genetic results in Chapter 8 that genetic and environmental influences on self-representation and representation of self and parent are significantly different in adolescence.



The distribution of attachment patterns found in this study especially the increased numbers of Dismissing attachment patterns in adolescence was different from the findings in previous studies in normative populations. In Ainsworth's study (1979) on infant-mother attachment patterns, it was found that 63% of the dyads were classified as Secure, 21% as Avoidant (Dismissing), and 16% as Anxious-Ambivalent (Preoccupied). The distribution of attachment patterns in Ainsworth's study was relatively representative of a normative population, which was also relatively similar to Hazan and Shaver's study (1987) on attachment of adult romantic love. Furthermore, a study of middle childhood (Shmueli-Goetz et al., 2008) also found a distribution of 61% of Secure attachment, 30% of Dismissing and 7% of Preoccupied. Nevertheless, this discrepancy between secure and dismissing attachment distributions may not be surprising as studies have been found inconsistent in demonstrating continuities in attachment security from infancy to later childhood, adolescence or adulthood (e.g. Becker-Stoll et al., 2008; Weinfield et al., 2004). Therefore, the conclusions drawn from some of the previous attachment studies in earlier childhood may not necessarily be applicable to the adolescent stage, especially as children's primary attachment relationships continue to develop dramatically in adolescence and the attachment styles differ significantly from previous stages (Furman & Simon, 2004; Furman et al., 2002). As the cognitive and relational transformations in adolescence have the potential to significantly influence adolescents' developing states of minds in relation to attachment, it may lead to significant discontinuities over the developmental process of adolescence (Allen, 2008).

Although in the natural course of development, without the presence of apparently stressful life events, the gradual increase in maturity and experience in new relationships should promote increasing attachment security over time as adolescents' working models become increasingly coherent and integrated (Allen et al., 2004). The attachment security during adolescence is not only influenced by a child's capacity to adapt to developmental changes, but also a parent's capacity to meet an adolescent's current attachment needs. Subsequently, in some circumstances, even previously securely attached adolescents and their parents may fail to adapt to the drastic changes during adolescence which further affect adolescents' current and future attachment relationships and social relationships (Allen, Hauser, et al., 2002). As indicated by affective quality of family relationships during adolescence, there is generally a

decrease in closeness, an increase in conflict in early adolescence and an increase in emotional distance within the affective relationships (Buist et al., 2002; Holmbeck, 1996; Steinberg & Morris, 2001). Age differences (Cobb, 1996) were reported to be associated with deterioration in quality of attachment of children to their parents from early to later adolescence (Buist et al., 2002; Papini et al., 1991; Paterson et al., 1994). Based on Allen and colleagues' study (2003; 2004), current relationship qualities between adolescents and parents are found to be stronger predictors of attachment security in adolescence, therefore, one of the explanations of the decrease in securely attached adolescents and the increase in the number of dismissing attachments in adolescence is a result of drastic transformations of adolescent development and the changing nature of the parent-child relationship during adolescence. The increase of Insecure-Dismissing attachment patterns may be due to a failure of re-negotiation of the child's position within the family to have a balance between striving for autonomy and maintaining positive relatedness with parents, and this process involves both adolescent's capacity to reconstruct the attachment relationships as they adjust to developmental changes and at the same time parents' ability to adapt to a changing role of providing a secure basis according to adolescent's current needs (Dubois-Comtois, Cyr, et al., 2013; Grotevant & Cooper, 1986; Rosenblum & Lewis, 2003). Therefore, both adolescents and parents who are not able to adapt to the changes and redefine their relationships by taking into account the individuation process in the adolescent may subsequently cause a decline in the child's attachment security in the current parent-child relationship.

Furthermore, as illustrated in the results of this study, there were indications of gender differences in adolescents' current attachment relationships. While the girls were reported to have a closer distribution of attachment patterns to normative distributions in other studies, with approximately 56% Secure, 32% Dismissing and 9% Preoccupied, boys had a significantly smaller number of Secure attachments with 43% and a larger in number, around 51%, of Dismissing. The Preoccupied and Disorganized cases were rather rare for boys with only 4% and 1% respectively. These results of gender differences were in part consistent with previous findings of Kobak and colleagues (1993), in which they found influence of gender on adolescent attachment to mother, with boys tending to be more Insecure-Dismissing than girls. Another potential reason to explain the increased insecure attachment in this study may be a result of the twin

effect, due to the special characteristics of the study sample. Although no significant differences were found between identical and fraternal twins in terms of attachment security in this study, the additional developmental task of separation and individuation from the twin relationship in adolescence is postulated to intensify the attachment demand from a secure basis and parents who are unable to meet the current attachment needs may have decreased attachment security in the parent-child relationship. Furthermore, as discussed in Chapter 3, Section 3.3, developmental difficulties of separation and individuation in adolescence may have already been underpinned in twins' early relationships with mother (Burlingham, 1963; Demarest & Winestine, 1955). Some of the difficulties are inherent in the twinship as early as infancy, such as mother's attitudes towards the twin birth, ability to treat each twin as a separate individual, twins' competition for maternal object's love, difficulties in establishing a good symbiotic object tie with the mother, intensified rivalry for passing various developmental stages simultaneously (see Chapter 3, Section 3.3). Furthermore, the narcissistic component invested in the co-twin, the featured regressive pulls in adolescence and twins' mutual interdependence all make the object tie of twinship hard to give up during the separation-individuation process, which may account for the overall lower levels of differentiation-relatedness in twins including non-identical twins. However, no conclusion could be drawn without validation of such hypothesis in a control sample of non-twin adolescents.

### **Mental Representations of Self and Other and Attachment**

As previously stated, the primary task for children in adolescence is widely recognized as attaining autonomy and growing independence from the family, and adolescence thus is a critical developmental period for self-definition and identity-formation. The declined security found in this chapter and some other studies, does not undermine the importance of the attachment relationships with parents. On the contrary, this study has found that adolescents with secure attachment to parents were reported to have significantly higher levels of mental representations of self and others than the insecurely attached adolescents. The differentiated-relatedness level of adolescents with secure attachment was found close to Level 6, especially the mental representation of self. In previous studies of Differentiation-Relatedness Scale, the Level 6

(Emergent/Ambivalent object constancy) was found to characterize a normal functioning representational level in adulthood (Luyten et al., 2006), differentiating the secure and insecure attachment with attachment figures (Levy et al., 1998). Therefore, the results found in this study further indicate that securely attached adolescents may yield a relatively more mature level of psychosocial functioning that starts to be equivalent to adults. In other words, secure attachment may facilitate the developmental process in adolescence (Cicchetti & Toth, 1998; Ryan & Lynch, 1989; Ryan et al., 1994).

In comparison, although the mean differences of the differentiation-relatedness levels were less significant, with variations among insecure attachment groups (*Tables 7.2 & 7.3*), the self-representational levels of Preoccupied, Dismissing and Disorganized adolescents were overall distinctively lower than the Secure ones. The Preoccupied attachment pattern in adolescence was characterized by the mental representational levels of self in particular moving from Level 5 towards Level 6 relatively equivalent to normal developmental levels of adolescence (see Chapter 6), however the adolescents with Dismissing attachment relationships had significantly lower self-representational levels, at approximately Level 5, than the Preoccupied. This difference of mental representation levels between the Preoccupied and the Dismissing attachment was slightly different from the findings of differentiation-relatedness levels in the previous adult study (e.g. Levy et al., 1998), in which the mean Differentiation-Relatedness score of Avoidance attachment (Dismissing) was 5.81 and 5.61 for Anxious-Ambivalent attachment (Preoccupied). As the Dismissing and Preoccupied insecure attachment patterns can be viewed as congruent with the fundamental polarity of self-definition and interpersonal relatedness respectively (see Chapter 2, Section 2.4), the difference of self-representational levels between the two insecure attachment patterns may indicate that at the stage of adolescence, adolescents with distorted or exaggerated preoccupation of self-definition as expressed in Dismissing attachment were less adaptive than the ones with preoccupation of relatedness in the Preoccupied. In other words, even though adolescence is marked as an important developmental stage for achieving autonomy and individuality, maladaptive exaggerated attempts to separate or to attain autonomy at the expense of the relationship with parents may further delay the normal developmental process of separation and individuation and subsequently yield a great impairment on the formation of self-identity. This finding is also consistent with extensive research findings that the development of attaining autonomy is most easily navigated in the

context of a close relationship with parents rather than at the expense of this relationship (Allen & Hauser, 1996; Allen et al., 1994; Allen et al., 2004; Grotevant & Cooper, 1986). In terms of the Disorganized attachment pattern, the Differentiation-Relatedness levels were close to Level 4 (self-other idealization or denigration) or even lower (Level 3 self-other mirroring). Due to the very limited number of Disorganized cases in this study, no generalized results or conclusions could be drawn at this stage. Nonetheless, the Disorganized adolescents were found overall to have a tendency to show even lower levels of mental representations than the other two insecure attachment patterns. The preliminary result of this small sample suggested that the Disorganized had an even less consolidated mode of dealing with issues or difficulties in interpersonal relationships as well as in formation of self-identity than the Insecure-Dismissing or the Insecure-Preoccupied, and thus might be related to more severe forms of psychopathology. In part, the lower mental functioning of self and others of the Disorganized also corresponded to the lack of consolidated or organized coping strategies in attachment situations as opposed to the maladaptive but organized coping strategies of the Preoccupied and the Dismissing.

However, as cross-sectional studies could not infer any causal relationships, it is equally possible that attachment security might be a result of levels of mental representation. As reviewed in Chapter 3, Section 3.2.2, attachment security in adolescence not only depends on a child's capacity to adapt to developmental changes based on previously internalized attachment experiences, but also a parent's capacity to meet the adolescent's current attachment needs. For the adolescent to explore cognitive and emotional autonomy requires not only the child but also the attachment figure to work in a goal-corrected partnership to maintain the attachment relationship (i.e. the secure base phenomena; see Allen et al., 2003). As suggested by Allen and colleagues' cross-sectional study (2003) and longitudinal study (2004), adolescent security is closely linked to family interaction patterns in the current context (also see Allen & Hauser, 1996; Dozier & Kobak, 1992). According to their findings, during adolescence, several family relationship qualities such as enmeshed, overpersonalizing interaction patterns between the adolescents and mothers were identified to predict declined levels of security even taking into account the initial levels of security. Thus, as lower levels of mental capacity of differentiation-relatedness may be more likely to intensify adolescent's conflict of autonomy and relatedness in the process of separation-individuation,

qualities of family interactions may subsequently be affected which may in turn be manifested in adolescent attachment security. The same principle could be applied to the relationship between higher levels of mental representation and secure attachment in adolescence. In other words, attachment security might be an outcome of indirect influences from the mental representation mediated by current family environment rather than the other way around.

### **Twinship Effect on Mental Representations of Self and Other**

Twin relationship has long been considered to be one of the most unique and intimate relationship bonds between two individuals (see Chapter 3, Section 3.3), and subsequently the potential formation of twin attachment has become an interesting and debated area (e.g. Fraley & Tancredy, 2012; Lytton, 1980; Neyer, 2002a; Neyer, 2002b; Segal & Ream, 1998; Woodward, 1998). Due to the limitations of the study, the potential attachment relationship between twins or the mental representations of twin relationships can not be directly assessed here. Nevertheless, the unique characteristics of the sample in this study have yielded some results with a potential impact on primary attachment relationships to parents in the twin relationship. According to the results, the levels of the co-twin reference and the quality of the twin relationships in the narrative were congruent with the characteristics of different attachment patterns to parents. It was found that the degree of co-twin reference in the interview significantly differentiated between secure and insecure attachment patterns as well as among attachment groups of Secure, Preoccupied and Dismissing. In fact, compared to the Differentiation-Relatedness of Self-Others, Self-Mother and Self-Father, the co-twin reference score was reported to be a better variable to differentiate between Secure, Preoccupied and Dismissing attachment patterns. The securely attached adolescent twins were found to have appropriate levels of reference to the other twin in the interview with perceived more positive twin relationships. The Dismissing adolescent twins tended to mention less, or try to avoid mentioning, the other twin in the interview, and the twin relationship quality appeared to be rather neutral. The Preoccupied twins were reported to have higher levels of reference to the other twin with some uncontrollable elaborations in the interview, and the twin relationships were relatively more negative. In other words, the results indicated that the Secure twins had higher

levels of mental representations of self and a more positive and healthier relationship with the other twin, whereas the Dismissing twins actively minimized the impact of the co-twin on self and tended to neutralize the quality of the twin relationship. The Preoccupied twins had more entangled mental states with the co-twin contaminating the representations of self and others, and the relationships between the twins were more negative. Although the differentiation-relatedness levels of self and the other twin could not be assessed directly using the Differentiation-Relatedness Scale due to insufficient narrative information in the interview (see Chapter 5), both the reference to the other twin and the perceived quality of the twin relationship reflected the mental representations of the self and the co-twin to a large extent. Thus, the concordant features between individual twin's attachment patterns and mental representations of the twin relationship suggested that individual twin's attachment relationship with parents may well affect their capacity to differentiate and consolidate the self from the other twin as well as the capacity to maintain an essentially positive, reciprocal twin relationship in adolescence. Secure attachment relationships with parents gave twins a stronger supporting basis for facing the developmental challenges of separating and individuating from each other especially at the adolescent stage (see Chapter 3, Section 3.3). Insecure attachment to parents may intensify the conflict of breaking off the object tie to the co-twin and subsequently affect the process of separating from the other twin and establishing self-identity. However, it should be noted that no causal link could be drawn in this cross-sectional study. Similarly as discussed above, it might also be possible that the separation-individuation process between twins influences the attachment security to parents. Considering the heightened vulnerability of twins in adolescence (see Chapter 3, Section 3.3), their attachment needs to parents may vary according to their mental capacity for separating from each other, which may subsequently affect their attachment security with the parents.

Furthermore, the effect of twin relationship was also explored by looking at the link between one twin's attachment pattern and the other twin's mental representations of self. It was reported that the levels of self-representation of the fraternal twins did not differ significantly whether the co-twin was securely or insecurely attached to the parents. As illustrated by the previous results, individual's attachment relationships with parents appeared to have a more significant impact on their capacity for differentiation and relatedness of self and others. For the identical twins, the results of twin

relationship were somewhat different than for fraternal twins. Although the results were only partially significant, in general it was found that identical twins with securely attached co-twins were more likely to have higher levels of mental representations of self, whereas identical twins with insecurely attached co-twins were reported to have lower levels of self representations. There are two potential ways to interpret these results. One of the explanations is that there were stronger commonly shared links between MZ twins than DZ twins on attachment security or on mental representation of self, such as genetic influences. Taking into account evidence of possible genetic influences on attachment in adolescence from the main TEDS attachment study (Fearon et al., 2013) and there being no indication of genetic influences on the mental representations of self (see Chapter 8), MZ twins were thus more likely to be concordant in attachment secure/insecure patterns than the levels of mental representations of self. Combining the findings in this chapter with the finding that the levels of mental representation of self was significantly associated with adolescents' secure and insecure attachment to parents (*Table 7.1*), the impact of an individual twin's attachment relationship on the co-twin's mental representations of self could be viewed as an indirect effect of concordant attachment patterns that subsequently contribute to congruent levels of self-representation. Another possible explanation was that co-twins might potentially serve as attachment figures to mediate the other twins' attachment relationships with parents. Based on the assumption of twin attachment proposed by Fraley and Tancredy (2006) and their subsequent study in a national representative sample (Fraley & Tancredy, 2012), beyond adolescence, twins, especially identical twins, are more likely to use their siblings as attachment figures than non-twin siblings on the basis of their genetic relatedness, mutual empathy including the other in self and shared experiences. Therefore, with the decreased reliance on parents as attachment figures, twins may become increasingly important for each other as attachment figures. They may be able to support each other as a secure base during adolescence and beyond, just as they can use each other as a transitional object when they are separated from mother (Sandbank, 1999). Therefore, the attachment functions twins may serve for each other can potentially facilitate the separation-individuation process. Therefore, securely attached twins might be inferred to provide a secure base that subsequently impacts on the co-twins' mental representation of self. It was at least partially indicated in this study that, for identical twins, securely attached twins were more likely to have co-twins with higher levels of representation of self, whereas insecurely attached



identical twins were more likely to have co-twins with lower levels of mental representation of self. Due to the limitations of this study, no conclusive evidence could support such a hypothesis. Further studies would be required to validate the potential direct effect of twin's attachment relationships on each other's mental representational levels.

### **Convergent Validity of the CAI-DRS**

In terms of convergent validity, besides the associations between the Differentiation-Relatedness levels and the attachment classifications that discussed earlier, all the items of the CAI-DRS scales including the DRS were further examined in relation to the dimensional items of the CAI (i.e. state of mind scales). As expected, items of Articulation, Quality of Relationship (or Self-Regard) and the Differentiation-Relatedness Scores from the CAI-DRS were positively correlated with the overall quality of CAI narratives including aspects of Emotional Openness, Balance of Positive/Negative, Use of Example, Resolution of Conflict and Coherence scores, and were negatively correlated with featured insecure indices such Dismissal and Idealizing of the CAI. The moderate correlations between the CAI-DRS and CAI states of mind scores suggested that the mental representation scores obtained from the CAI narratives corresponded to the different dimensions of the CAI, however they are not overlapping. Since the CAI-DRS used sections of the interview content from the Child Attachment Interview that on the whole were also used for attachment assessment, a number of issues should be addressed. First of all, the sections of the interviews used for the CAI-DRS coding were the descriptions of self and relationships with attachment figures that tapped into mental representations of self and representations of relationships with parents in a relatively free and general sense. In the process of attachment coding, these sections only partially contribute to the state of mind scales such as emotional openness, balance of positive/negative qualities and use of examples. The main emphasis of attachment assessment was placed on perceived availability and accessibility of attachment figures in times of conflict, distress, illness, hurt, separation and loss in the interview, for the reason that the evaluation of attachment relationships requires activating the attachment system to elicit attachment related information. Secondly, the mental representations of self and others and internal working models of attachment

relationships are interrelated as both theoretic constructs are deeply rooted in the early affective bonds between infant and primary caregiver which gradually unfold in cognitive-affective schemas and subsequently guide and influence a child's subsequent development. However, the Differentiation-Relatedness of self and others and Internal Working Models of attachment relationships are not the same. The IWMs of attachment research are largely limited to prototypic attachment patterns that are defined by quality of attachment relationships including a model of the self as either positive or negative and models of significant others as positive or negative (see Chapter 2). Therefore, the categorical approach of attachment classifications remains relatively broad and static and reflects little potential intricacy, complexity or developmental levels when compared to the psychoanalytic concepts of the representational world. Unlike the attachment classification system that focuses on the content of representations of self and others (i.e. positive or negative qualities), the Differentiation-Relatedness Scale of the CAI-DRS, that is well informed by object-relations theorists and cognitive psychologists, has largely emphasized the structure of representations and thus provided a more sophisticated and dynamically-oriented perspective for different developmental levels of the mental representations of self and others (i.e. IWMs). In other words, the attachment assessment and the differentiation-relatedness scale are complementary rather than being exclusive in understanding the development of individual's mental representations of self and others (Blatt & Blass, 1990; Blatt & Levy, 2003; Lyons-Ruth, 1991; Zelnick & Buchholz, 1990a), as different patterns of attachment not only differ from each other in the content of IWMs but also in the structure of those models. Furthermore, even within the same attachment classification, individual's mental representations of self and others may involve differences in degrees of differentiation and integration with respect to mental functioning and capacities for adaptation (see Chapter 2, Section 2.4). In addition, as can be seen from the inter-item matrix of the CAI-DRS and the states of mind continuous scales of the CAIs (*Table 7.8*), the two measures are inter-related in a dynamic and multi-level manner. It has shown that to a large extent, the convergent validity between the CAI-DRS and the CAI might be to a great extent based on individual's discourse usage, perceived relationship qualities with primary caregivers and capacity for affect regulation that are reflected in the narrative account. However, the moderate correlations among items suggest that the two measures captured different dimensions of the mental representing of self and others. For instance, the Coherence from the CAI primarily assesses discourse usage according

to adherence or violations of linguistic maxims such as quality, quantity, relations, and manner (Grice, 1975), which correlated to the CAI-DRS with some shared linguistic aspects whereas Coherence did not directly link to the developmental process or differences in the structure of mental representations.

Finally, the original Differentiation-Relatedness Scale and the Child Attachment Interview measures have shown solid reliability and validity evidence respectively prior to this study. In this study, the reliability of attachment codings and CAI-DRS codings were strictly independently conducted by two different groups of raters. Furthermore, the two measures' results were compared in relations to the symptom inventory CASI-4R. It was reported that the secure/insecure attachment patterns of adolescents could only effectively detect symptom severity difference in symptoms of Schizoid Personality Disorder, Schizophrenia and Bipolar Disorder within this normative sample. The low/high levels of mental representations of self (i.e. the Self-DRS) were able to differentiate the symptom groups of AD/HD Inattentive, AD/HD Combined, Generalized Anxiety Disorder, Schizoid Personality Disorder, Schizophrenia, Dysthymia and Bipolar Disorder (see Chapter 6). In terms of continuous scale of Coherence of the CAI and the Differentiation-Relatedness scores, although the correlations with symptom severity scores of the CASI-4R were equally weak, the correlations between CAI overall coherence scores and the severity *T scores* were only significant in the categories of Schizoid Personality Disorder and Schizophrenia whereas the mental representation of self was significantly correlated to severity scores of the symptoms of AD/HD Inattentive, AD/HD Combined, Conduct Disorder, Antisocial Personality Disorder, Oppositional Defiant, Generalized Anxiety, Dysthymia and Anorexia, besides the common symptom categories of Schizoid Personality Disorder and Schizophrenia. In summary, despite the moderate correlation between the Self-DRS and the CAI coherence score, the Self-DRS was reported overall to have relatively stronger correlations with the symptom severity scores of the CASI-4R. In other words, the mental representation of self was argued to be a more sensitive assessment construct to capture symptomatology in adolescence.

## 7.5 Conclusion

In conclusion, the CAI-DRS was reported to have good convergent validity with the CAI attachment measure. Items of the CAI-DRS corresponded to dimensional items of the CAIs to a reasonable degree without indications of overlapping. Overall, with reservation to generalize the results, adolescents, especially adolescent boys, were found with decreased security in attachment relationships to parents. The mental representation of self that have become critical in personality development as children are working towards more a generalized stance of attachment relationships and starting to consolidate a more comprehensive structure of self-identity during adolescence. According to the study, different attachment patterns involve differences in levels of differentiation and integration of self and others, and may therefore result in differences in psychological functioning and capacity for adaptation. Secure attachment to parents might facilitate the developmental process in adolescence, as the securely attached adolescents in the study yielded a relatively more mature level of psychosocial functioning that starts to be equivalent to adults. Individuals with insecure attachment were more likely to encounter severe interference in the separation-individual process and further impair the formation of self-identity. In addition, attachment relationships with parents also had a significant impact on the twin relationships and their capacity to differentiate and consolidate self from the co-twin in adolescence. Secure attachment relationships with parents may provide twins a stronger base for separating and individuating the twins from each other. In short, Differentiation-Relatedness and attachment measures are inter-related measures, however the emphasis of assessment is on structure or content of the mental representations of self and others respectively. The integration of the two approaches has provided a more intricate and developmental perspective to elucidate the ways in which the attachment system interfaces with personality development and the associations with psychopathology. Based on the reliability and validity of the CAI-DRS examined, Chapter 8 will examine the degrees of genetic and environmental influences on mental representation of self and other.

## **Chapter 8 Genetic and Environmental Influences on Mental Representations: a Behavioural-Genetic Study of the DRS on Adolescent Twins**

### **8.1 Introduction**

As mental representation of self and other is one of the fundamental constructs of normal and disrupted personality development (Blatt, 1974; 1995; Blatt & Lerner, 1983a; Blatt, Wild & Ritzler, 1975), it is important to understand the causal factors involved in individual differences in its development across the lifespan. The strong theoretical arguments from psychoanalytic object relation theories, attachment theory and cognitive developmental theory have predominately advocated the role of the early mother-infant experiences in the development of mental representations of self and others and how such interactional templates could lay the foundations for the development of self-definition and interpersonal relatedness (see Chapter 1 and Chapter 2). Such theoretical assumptions regarding personality development across various disciplines have inspired an impressively productive line of research studies on the environmental causes of individual differences in mental representations (Chapter 1, Section 1.4.1). In the two polarities model, quality of parenting or parental mental capacity for parenting is still considered one of the most significant contributors to the development of self-definition and interpersonal relatedness (e.g. Ahmad & Soenens, 2010; Soenens et al., 2005; Soenens et al., 2010).

However, it is important not to lose sight of the fact that attachment security or parenting is only one of many factors that predict children's personality development and wellbeing (Chapter 1, Section 1.4). Overly emphasizing early mother-infant attachment experiences might overlook other important factors involved in personality development or lead to very limited attempts to test the possible factors involved in the developmental process of mental representations. Taking attachment studies for instance, preeminent empirical evidence has supported the idea that maternal sensitivity and responsiveness to a child's attachment needs is a significant causal antecedent of a child's attachment security (see Belsky, 1999), whereas research designs have almost exclusively emphasized the influence of environmental factors. It is not until very recently that the casual antecedents of attachment security have been put under the microscope of systematic behavioural-genetic studies deconstructing variance

potentially caused by genes and environment.

Previous studies of behavioural genetics especially in the field of attachment have consistently found evidence to support the primary role of environmental effects on individual differences in attachment security for infants and children in early childhood leaving the genetic effect to be approximately none (Bokhorst et al., 2003; Fearon et al., 2006; O'Connor & Croft, 2001; Roisman & Fraley, 2008). These findings are consistent with other analysis results that show parental antecedent of infant attachment security is influenced by environmental influences (Bakermans-Kranenburg et al., 2003; De Wolff & van Ijzendoorn, 1997; van Ijzendoorn, 1995). However, studies in adolescence and adulthood have indicated varying degrees of genetic evidence. Recent behavioural-genetic studies of adolescent attachment and attachment studies of self-reported romantic love in young adulthood have reported relatively similar heritability results on the dimension of attachment anxiety (Brussoni et al., 2000; Crawford et al., 2007; Picardi et al., 2011). Despite measurement differences across age, the discrepant genetic evidence found in attachment security from infancy to young adulthood suggests that the underlying mental representations or IWMs of attachment relationship may have different mechanisms involved as they evolve in the development process.

Furthermore, from a slightly different perspective, some behavioural-genetic studies investigating the nature of the relationship between child personality and family environment have suggested that the association between the two is mediated by genetic factors. It was indicated in a number of studies that measures of family environment including parenting are modestly heritable (e.g. Bouchard & McGue, 1990; Elkins et al., 1997; McGue et al., 2005; Rowe, 1981). In a way, it is proposed that individual's genetically influenced characteristics could affect the environmental measures and the genetic manifestations found on environment may just reflect the personality characteristics (Bouchard & Loehlin, 2001). In the Minnesota Study of Twins Reared Apart (MISTRA) project, there is also evidence suggesting that the same genotype leading to adult personality influences individual's recall of the childhood rearing environment (Krueger et al., 2003). Based on these findings of personality traits and behavioural-genetic studies on attachment, at least on the interpersonal dimension, the genetic influences might become more evident on the current qualities of parent-child relationships as well as the underlying relational schemas during adolescence as personality becomes more stabilized and mature.

In adolescence, considering the drastic transformations of attachment system during the period (Chapter 3, Section 3.2.2) as well as limited continuities of attachment from infancy to adolescence (Chapter 2, Section 2.2.2), adolescence thus becomes a critical stage to test the genetic and environmental influences on attachment security. In the most recent twin study from the TEDS on adolescent attachment (Fearon et al., 2013), possible genetic and environmental influences were carefully examined. In a sample of 551 pairs of same-sex twins with a mean age of 15, the attachment patterns of adolescents were assessed by the semi-structured Child Attachment Interview (Shmueli-Goetz et al., 2004). It was found that there were robust associations between MZ twins' coherence scores as well as overall security of attachment ( $r = .42$ ,  $p < .001$ ;  $\kappa = .26$ ,  $p < .001$ ), but substantially lower associations for DZ twins ( $r = .20$ ,  $p = .001$ ;  $\kappa = .09$ ,  $p = .20$ ). Model-fitting analyses indicated approximately 40% heritability and 60% non-shared environmental effects of attachment variance with negligible influence of the shared environment. The results of this study indicated potentially significant genetic effects on attachment security during adolescence, which suggested that mechanisms involved in individual differences in attachment might differ significantly beyond early childhood (Fearon et al., 2013).

Therefore, combining previous findings of genetic influences on related mental representational constructs and intergenerational transmissions of two polarities personality traits (see Chapter 3, Section 3.4.3; see also Beebe et al., 2007), it is crucial to examine whether there is any genetic mechanisms involved in the development of mental representation. In this chapter, a subsample of the TEDS attachment study was used to test the possible genetic and environmental influences on mental representations using the adapted CAI-DRS measure. As the IWMs of attachment and the mental representation of self and other are interrelated at a certain level, it was hypothesized that a significant proportion of the variance in mental representations might be attributable to genetic factors. To be more specific, at least the levels of differentiation-relatedness of self and significant other (i.e. Mother-DRS and Father-DRS) were expected to correspond to the genetic findings of the attachment relationship from the main TEDS attachment study as both reflected the relational dimension of the IWMs or mental representations. The current study uses the classical twin design to estimate potential heritability of mental representations by comparing the levels of mental representations of identical and non-identical twins reared in the same family. Further,

the analytic method of structural equation model fitting will be applied to estimate the variance in mental representations caused by relevant genetic and environmental influences. Moreover, the genetic estimates for mental representations are compared and contrasted with the genetic results for attachment in the study as a complementary attempt to understand the complex mechanisms involved in the personality development.

## **8.2 Method**

### **Data Analysis**

The reasons for use of behavioural-genetic analysis to examine genetic and environmental influences on mental representation of self and other is outlined in Chapter 4 Section 4.4.4. In this chapter, the data were first explored by observing basic descriptive quantitative data comparing MZ and DZ twins on means of the DRS. Following which, the twin-cotwin correlations on the DRS between MZ and DZ twins were compared and subsequent heritability estimates were calculated using the standard method of estimating heritability from the twin correlations. In the second part of the study, formal tests of structural model-fitting were applied to decompose the variance of the DRS into additive genetic (A), shared environmental (C) and non-shared environmental (E) components on the basis of the trait covariance observed for MZ and DZ twins. The results of the univariate twin analysis were compared by the maximal-likelihood estimates for the ACE model and the nested sub-models including AE, CE and E models to determine the best fitting model along with the standardized estimates of the model parameters for the best-fitting model using Mx software (Neale & Cardon, 1992). Model-fitting was tested by the fit of the most general genetic and environmental model which includes three parameters A, C and E and then proceeded by testing the reduction in model fit when A and C were dropped from the model while E was always retained. As the difference in  $-2 \log$  likelihood ( $-2LL$ ) between the saturated model and a nested sub-model is distributed as chi-square, it was used to test the difference in fit between models. The best fitting model was taken to be the one with the fewest number of parameters that could be achieved without significantly reducing model fit. In short, this chapter aims to provide relatively accurate estimates of the power of genetic, shared environmental, and non-shared environmental influences on the mental representations



of self, and the representations of self and significant others with standard errors of estimates using the overall best model fit.

### 8.3 Results

The results of this chapter are presented in two sections. In the first part, the descriptive means of the DRS scores were compared between MZ twins and DZ twins, which was followed by the estimates of heritability based on the correlations of twins. Furthermore, the results of the univariate twin analysis were presented applying the model-fitting methods to the variance-covariance matrices with derived estimates of model parameters. In the second part of this section, the potential genetic influences on attachment were examined, comparing and contrasting levels of the differentiation-relatedness of self and others. As a reference, the heritability of attachment was also estimated based on a twin correlation analysis of CAI coherence and a binary analysis of secure-insecure concordance rate between MZ and DZ twins.

**Table 8.1 Descriptive Statistics on the DRS for MZ and DZ Twins (N=320/160 pairs)**

		Twin 1			Twin 2		
		Self-DRS	Mother-DRS	Father-DRS	Self-DRS	Mother-DRS	Father-DRS
MZ	Mean	5.25	5.26	5.42	5.55	5.25	5.27
	SD	1.38	1.14	1.18	1.16	1.18	1.11
	N	80	80	79	80	80	78
DZ	Mean	5.56	5.44	5.50	5.75	5.39	5.48
	SD	1.42	1.26	1.16	1.19	1.27	1.16
	N	80	80	80	80	80	80

**Table 8.2 Correlation and Variance-Covariance Matrix for DRS for MZ and DZ Twins (N=160 pairs)**

Twin 1		Twin 2			
		Self-DRS		Mother-DRS	Father-DRS
MZ	Correlation	.14		.35	.29
	Var-Cov	1.91		1.31	1.34
		.23 <sup>a</sup>	1.34	.47 <sup>a</sup> 1.38	.40 <sup>a</sup> 1.24
DZ	Correlation	.07		.19	.10
	Var-Cov	2.02		1.59	1.34
		.12 <sup>a</sup>	1.41	.31 <sup>a</sup> 1.61	.14 <sup>a</sup> 1.34

<sup>a</sup> covariance

According to the descriptive statistics provided in the *Table 8.1*, DZ twins were reported to have slightly higher DRS scores than MZ twins, however regression test results did not show any significant differences between the DRS means for MZ and DZ twins. The twin intraclass correlations and covariance matrix results are presented in *Table 8.2*. As can be observed, the intraclass correlations on the Self-DRS for neither MZ twins ( $r=.14$ ,  $p=.21$ ) nor DZ twins ( $r=.07$ ,  $p=.54$ ) were significant and the correlation coefficients were negligible ( $r<.20$ ). For the scale of the Mother-DRS, there was a significant correlation for MZ twins ( $r=.35$ ,  $p=.002$ ) however not for DZ twins ( $r=.19$ ,  $p=.09$ ). Similar results were found on the Father-DRS. The intraclass correlation was significant for MZ twins ( $r=.29$ ,  $p=.03$ ) but not significant for DZ twins ( $r=.10$ ,  $p=.36$ ). By comparing the correlations for MZ and DZ twins, it was observed that the MZ twin correlations were larger than the DZ correlations, which suggests possible genetic influences on the DRS for the reason that in twin studies a significantly larger MZ correlation compared to DZ correlation is evidence for the existence of genetic influence on a trait. Using the standard method of estimating heritability from twin correlations<sup>8</sup>, the estimated heritability (H) results were 14% on the Self-DRS, 32% on the Mother-DRS and 28% on the Father-DRS. The estimated environmental factors not shared between twins (E) accounted for 86% on the Self-DRS, 65% on the Mother-DRS and 71% on the Father-DRS. The result showed that E effects accounted for a great

<sup>8</sup> Here Falconer's formula was valid as the sample was only comprised of same-sex twins. Based on the assumption that MZ twins share all their genes whereas DZ twins share on average half of their genes, the formulas are as follows: Heritability ( $H^2$ )=  $2(r_{mz}-r_{dz})$ ,  $c^2=r_{mz}-H^2$  and  $e^2=1-r_{mz}$ . The genetic influence here only refers to a narrow sense of heritability.

majority of the variance in the sample tested. The proportion of variance due to environmental factors shared between twins (C) was almost non-existent.

The results so far suggest some genetic influences on the DRS of self-mother and self-father. The Self-DRS was not further examined due to the weak and negligible correlation coefficients, as both for MZ and DZ the correlation coefficients were less than .20. Hence, a formal test of structural equation models was undertaken to evaluate the genetic and environmental influences on variance-covariance of mental representations of significant relationships. The results of the ACE model and nested sub-models are summarized in *Table 8.3* below. The model fit is shown in the column minus twice the log-likelihood (-2LL) that was equivalent to chi-squared statistics. According to the statistics, the full ACE model obtained relatively similar estimates of heritability (Mother-DRS: A=37.5%; Father-DRS: A=28%) as the correlation analysis (Mother-DRS:  $H^2=32\%$ ; Father-DRS:  $H^2=28\%$ ). In other words, the model-fitting analysis estimated that 37.5% of the variation on the mental representation of the relationship between self and mother and 28% on the mental representation of the relationship between self and father in the population was due to genetic effects. The result of heritability 37.5% of mental representation of self-mother was relatively more accurate than the previous estimate of the 32% obtained from the correlation analysis. The reason for the difference was that the model-fitting analysis took into account the small differences amongst the variances. According to the statistics, the best-fitting model was the AE model as the effect of the shared environment (C) was close to none. Therefore, the AE model provided the most parsimonious explanation of the observed data given the defined criterion for significance .05 [Mother-DRS:  $\chi^2(7)=2.30$ ,  $p=.94$ ; Father-DRS:  $\chi^2(7)=2.57$ ,  $p=.92$ ]. The standard estimates from the AE model were the same as the impact of genes and non-shared environment estimated from the ACE model. Overall, it could be concluded in this study that the AE model provided a better fit to the data than the ACE, the CE or the E models. The model yielded estimates of 37.5% genetic influences on the mental representation of self-mother (95% Confidence Interval = .23-.52) and 62.5% non-shared environmental influences (95% CI=.48-.77), as well as 28% effect of genes and 72% effect of non-shared environment on the mental representations of self and father.

**Table 8.3 ACE Models & Nested Sub-Models\***

Models	Model Statistics			Parameter Deletion			Model Parameter estimates		
	-2LL/ $\chi^2$	DF	p	$\Delta\chi^2$	DF	p	A	C	E
<u>Mother-DRS</u>									
ACE	2.30	6	.89				.375	.00	.625
AE	2.30	7	.94	-	-	-			
CE	4.19	7	.76	1.89	1	.17			
E	15.92	8	.04	13.62	2	<.01			
<u>Father-DRS</u>							A	C	E
ACE	2.57	6	.86				.28	.00	.72
AE	2.57	7	.92	-	-	-			
CE	3.93	7	.79	1.36	1	.25			
E	9.84	8	.28	7.27	2	.03			

\*User define type I error: 0.05

Following the examination of the genetic and environmental influences on the differentiation-relatedness of self and significant others, as a comparison, a simple correlation analysis based on Falconer's formula was performed on the CAI coherence score to estimate the genetic effects of attachment in this study sample (for a more detailed report of genetic and environmental influences with sufficient statistic powers on adolescent attachment in the overall TEDS attachment study see Fearon et al., 2013). As shown in *Table 8.4* below, there were no real differences on mean coherence scores observed between MZ twins and DZ twins or reported by linear regression. *Table 8.5* below shows that the correlation coefficient for MZ twins ( $r=.38$ ,  $p<.001$ ) was approximately twice as large as for DZ twins ( $r=.19$ ,  $p=.09$ ), which suggested possible genetic influences. Using the standard twin correlation analysis, the heritability was estimated to be 38% and 62% of non-shared environmental influences (E) on coherence, with no effect of shared environmental influences (C). Furthermore, *Table 8.5* also presents cross-tabulations of within twin-pair secure-insecure frequency counts classified by zygosity. As the secure-insecure attachment patterns were highly concordant between attachment figures of father and mother, only the attachment patterns with mother were used here, to illustrate. It was reported that the secure-insecure association between MZ twins was significant ( $\kappa=.23$ ,  $p=.04$ ), whereas the DZ twins did not show any significant result ( $\kappa=.10$ ,  $p=.37$ ). The maximum likelihood estimates for the recurrent risk of attachment insecurity to a co-twin of an

affected individual twin was calculated by pairwise concordance and probandwise concordance (see McGue, 1992). The pairwise rate of attachment insecurity was 43% for MZ twins and 38% for DZ twins. Furthermore under the assumption of complete ascertainment, the probandwise concordance for MZ twins was 60% whereas it was 55% for DZ twins. The approximate 50% of insecure attachment rate in this sample (see Chapter 7) and the differences of the probandwise concordance rates between the MZ and the DZ suggest additive genetic effects<sup>9</sup> (Risch, 1990).

**Table 8.4 Descriptive Statistics on the DRS for MZ and DZ Twins (N=320/160 pairs)**

	MZ twins		DZ twins	
	Twin 1	Twin 2	Twin 1	Twin 2
N	80	80	80	80
Mean	5.28	5.16	5.27	5.00
SD	1.65	1.53	1.79	1.64

**Table 8.5 Cross-Tabulation for CAI Two-Way Classification and Correlation and Variance-Covariance Matrix for DRs for MZ and DZ Twins (N=320/160 pairs)**

Twin 1		Twin 2			
		Cross-tabulation		Coherence	
		Secure	Insecure	Correlation	Var-Cov
MZ	secure	26	17	.38	2.71 <sup>b</sup>
	Insecure	14	23		.97 <sup>a</sup> 2.35 <sup>b</sup>
DZ	Secure	22	19	.19	3.18 <sup>b</sup>
	Insecure	17	22		.55 <sup>a</sup> 2.68 <sup>b</sup>

<sup>a</sup> covariance <sup>b</sup> variance

<sup>9</sup> The additive effect was examined by comparing the Population Risk Ratio (PPR), which equals probandwise concordance divided by population prevalence. The population prevalence here used the sample insecurity ratio that was approximate 50%. The results showed that  $PPR_{mz-1}=2(PPR_{dz-1})$ , which suggest an additive genetic effect – either monogenic or polygenic – on attachment security. For further references of the method see James (1971) and Risch (1990).

## 8.4 Discussion

The aim of this chapter was to examine the possible genetic influences on mental representations. Illustrated both by the standard method of correlation analysis for heritability estimates and the ACE model-fitting method, it was reported that there were no significant genetic influences on the mental representations of self, however, there were indications of genetic effects on the mental representation of self and mother and on the representation of self and father. The estimates of heritability obtained from the study for differentiation-relatedness of self-mother and that of self-father were approximate 38% and 28% respectively. The remaining variance was attributed to non-shared environment and possible measurement errors with almost no effect of shared environment. Similarly, all variance in the self-representation was attributed to non-shared environment and measurement errors. Within the same sample of this study, similar estimates of 38% genetic effect on the coherence score of the CAI were found with the remaining 62% variance attributed to non-shared environmental influences. Not only was the variance of genetic effect relatively equivalent between the differentiation-relatedness of self and mother and the overall coherence of the attachment narrative, but also the findings were highly congruent with the results obtained from the main study of the TEDS attachment study (Fearon et al., 2013). For the same cohort but a larger sample of 551 twin pairs with sufficient statistical power, model-fitting analyses reported estimates of 38% genetic influences in coherence and approximate of 35% genetic influences in the two-way attachment classifications with mothers (i.e. secure and insecure). Again, in the same way, the remaining variance was attributed to non-shared environmental effects and measurement error.

### Statistical Power of This Study

Before discussing further the implications of the findings, the statistical power of this study should first be addressed. As can be seen from the result section, the intraclass correlations of the MZ twins on the differentiation-relatedness of self-mother and that of self-father were both significant whereas the correlations for the DZ were not. In comparison, both the correlations of the MZ and DZ twins were not significant on the

differentiation-relatedness of self and others in general (i.e. self-representation). The correlations were rather weak with both coefficients significantly less than .20. Subsequently in this study, the genetic effects on the mental representation of self were not examined further as the preliminary correlation analysis only suggested variance might be attributed to minimal, or no, genetic influence.

It might be controversial to further analyze the genetic effects on the mental representations of self and parents when the DZ correlations were also non-significant and the coefficients were less than .20. There is a possibility that the non-significant  $p$  value of the DZ correlations might suggest sampling error, or, in another related possibility, be due to the insufficient statistical power of this study. Although the DZ correlation coefficient was negligibly small for the mental representation of self and father in DZ twins, the coefficient for the mental representation of self-mother in DZ twins was relatively stronger ( $r=.19$ ). As illustrated by statistical simulation for correlation coefficients, the estimated sample size required for 80% power to detect significant correlation at the .05 level was approximately 170.

Moreover, as reported in the larger TEDS attachment study (Fearon et al., 2013) with a sample of 551 twin pairs, the correlation was found significant at .20. Therefore, it was argued that the non-significant correlation for the differentiation-relatedness of self and mother in the DZ twins was more likely to be caused by the insufficient statistical power of the sample as the correlation coefficient for coherence of CAI in the TEDS attachment study was relatively similar to what had been found for the mental representation of self and mother in this study. The weak correlation of the mental representation of self and father for DZ twins was retained for further validation, as the MZ correlation was rather robust.

In terms of the model-fitting tests, the Mx software was able to yield a best-fitting model AE for this study. According to the statistics (see *Table 8.3*), the sample size was sufficient to reject the 'wrong' model E when dropping the model parameters of A and C. However, there was not enough statistical power to successfully reject the CE model deleting the parameter of additive genetic variance. Ideally, the number of pairs required for a power of .80 to reject the CE hypothesis when it is false at 0.05 significance level by maximum likelihood estimates, is 547 with 0.52 proportion of MZ twins among all pairs (see Visscher, 2004). Nevertheless, the sample size at this stage

was sufficient to determine the best-fitting model compared with other alternative sub-models and provided a relatively good enough estimation of variances of heritability and non-shared environmental effects that were similarly found in the main attachment study of the TEDS (Fearon et al., 2013). Re-estimation of the genetic and environmental influences on mental representations in a larger sample would be extremely valuable in the future.

### **Speculations about the Genetic Results**

The genetic result of the differentiation-relatedness of self-mother in this study was notably similar to the genetic effect found on the attachment relationship with mother, of which the coherence of the CAI narrative as well as the binary secure-insecure attachment classifications had also indicated approximately 40% heritability and 60% non-shared environmental influences with almost no effect of shared environment both in this study and the main TEDS attachment study (Fearon et al, 2013). The relatively equivalent heritability and non-shared environmental influences found may be explained in a number of possible ways, although they are not exclusive. One possible reason is that the differentiation-relatedness of self and mother was overlapping with the attachment relationship, measuring exactly the same dimension of the mental representations (i.e. the specific attachment relational dimensions of the IWMs). Another potential explanation was that the genetic analyses picked up certain strong or crucial common mechanisms that determined both the levels of mental representations of self and mother and the relational working models of the IWMs in adolescence.

From a theoretical point of view, the two theoretical constructs of mental representation of self and other and internal working models are interrelated while differing in some aspects of the fundamental affective-cognitive schemas (see Chapter 1 Section 1.2, Chapter 2 Section 2.3 and Chapter 7). In particular, in this study, the differentiation-relatedness levels were regarded as different developmental levels of the mental representations (i.e. IWMs) which focused more on the representational structure whereas the attachment measure of the CAI emphasized the quality of attachment relationships (i.e. content of IWMs). To break this down in detail, the coherence scale of the CAI reflected an aspect of “state of mind” regarding overall attachment experience by measuring the discourse usage in terms of degree of realism and



integration of attachment relationship in narratives, and the secure-insecure attachment patterns were relationship specific, tapping into the quality of mental representations of self and mother (Shmueli-Goetz et al., 2008). In a way, Coherence of the CAI is more closely linked to the differentiation-relatedness of self and others in terms of particular emphasis on the cognitive components on narratives. However, as addressed by Levy and Blatt (1999), the concept of coherence as from the AAI is primarily based on the discourse usage in linguistic analysis (Grice, 1975) which does not link to the developmental process nor identify differences in the structure of mental representations.

Despite some similar aspects of the mental representations that are assessed by the two components of the CAI measures, the differentiation-relatedness scale was still able to provide more dynamic, intricate and multi-developmental levels of the representations of self and others in addition to the prototypic attachment patterns (see Chapter 2, Section 2.3). Furthermore, the development of the DRS and the CAI are distinctly separate, from different theoretical backgrounds (see Chapter 1 and Chapter 2), and both measures are well established with solid validity and reliability. Also in this study, the coding processes of the adapted CAI-DRS and the CAI were rigorously independent, and the raters were blind to both the content and the procedures of the other team. Therefore, based on these assumptions and the empirical evidence from Chapters 6 and 7, the possibility of overlapping measurement errors between the CAI and the CAI-DRS were largely diminished, although not completely eliminated. It was more likely that the resemblance found in variance caused by genetic and environmental factors might be due to the strong determinants that contributed to both the levels of differentiation-relatedness of self and mother and the attachment relationship with mother, especially as both measures reflected the mother-child relational dimension of the mental representations or the IWMs.

At this stage, it was impossible to pinpoint specific mechanisms that might cause the observed genetic effects found on both the differentiation-relatedness of self and mother and the attachment relationship with mother. Nevertheless, based on the common factors among the indicators of the DRS, Coherence of the CAI narrative and the attachment classifications within the broad context of personality development, one conspicuous component was the individual's ability to reflect and reorganize the mental states of both self and significant others in earlier attachment experiences with the newly acquired cognitive skills at the adolescent stage. Taking into account consistent

findings of no genetic effect on attachment for infants and toddlers from previous twin studies (Bokhorst et al., 2003; Fearon et al., 2006; O'Connor & Croft, 2001; Roisman & Fraley, 2008) and limited demonstrations of the attachment continuities from infancy to adolescence (e.g. Becker-Stoll et al., 2008; Weinfield et al., 2004), the genetic results in this study potentially suggest that the cognitive transformation in mental capacity (Inhelder & Piaget, 1958) that allows a critical shift in the mechanisms of psychological development from internalization and identification to integration (Blatt & Blass, 1990) might be substantially influenced by genetic factors from adolescence. This hypothesis is also consonant with Main's (1996) theoretical view in attachment theory that an individual's ability to think coherently about, to reflect upon and to integrate early attachment experiences may depend on personal attributes that are considered to be partly heritable. Furthermore, in the Minnesota Study of Twins Reared Apart (MISTRA) project, there is also evidence suggesting that the same genotype leading to adult personality influences individual's recall of the childhood rearing environment (Krueger et al., 2003). In other words, the genetic evidence found in the differentiation-relatedness of self and mother and attachment with mother might be due to the affective-cognitive mechanisms responsible for attachment related experiences that are underpinned by certain genetically influenced personality traits.

A third possible way to interpret the genetic effect found on the mental representation of self and mother or attachment relationship with mother in adolescence is that the observed genetic effect is a direct or indirect result of growing genetic-environmental interactions in normal development. During the adolescence phase, the emerged self-identity and the existing interpersonal relatedness with parents (i.e. primary attachment relationships) continue to go through some rapid changes. In order to achieve a good balance between development of a consolidated self and the maintenance of positive attachment relationships with parents, requires a re-negotiation process of the child's role in the family between the adolescent and the parents to a great extent. The previous interpretation of possible genetic factors focused on the child's capacity to establish self-identity and reconstruct the attachment relationships as they adjust to the cognitive, emotional and social changes during adolescence (Rosenblum & Lewis, 2003). An alternative approach to explaining the variance in mental representations involves the parents' adaptation to their changing role for providing security and for responding to the adolescent's current needs.

According to some empirical studies, the current relationship qualities between adolescent and parents are stronger predictors of changing attachment security compared to the weak associations between maternal attachment status and adolescent's attachment status by middle to late adolescence (Allen et al., 2004; Allen et al., 2003). Gathering the evidence from behavioural-genetic studies on relationship between adolescent personality and family environmental influences in personality studies (Chapter 1, Section 1.4.2), family environment including parenting is modestly heritable (e.g. Bouchard & McGue, 1990; Elkins et al., 1997; McGue et al., 2005; Rowe, 1981) as individual's genetically influenced characteristics could affect the environmental measures and the genetic manifestations found on environment may reflect these heritable personality characteristics (Bouchard & Loehlin, 2001; Scarr & McCartney, 1983). According to Scarr and McCartney (1983), two mechanisms are involved in the genetic link between personality and environment. Evocative correlation occurs when an individual's genetically influenced personality characteristics evoke specific responses from others, and active correlation occurs when genetically influenced personality characteristics affect the process of individuals actively selecting their environments or the process whereby they make attributions regarding aspects of their interpersonal relationships (Scarr & McCartney, 1983).

Putting the two pieces of information together, as the IWMs or mental representation of self and mother become increasingly affected by current quality of family environment and the increasingly genetic influences of evocative correlation or active correlation between personality and family environment during adolescence (e.g. Elkins et al., 1997; O'Connor, Deater-Deckard, Fulker, Rutter, & Plomin, 1998; Pike, McGuire, Hetherington, Reiss, & Plomin, 1996), the observed genetic factors found in the mental representation of self and mother might potentially be attributed to changes of parental care evoked by the child's genes during the adolescence which are subsequently expressed in the forms of genetic influences on the current mental representation of self and mother. In short, as the child grows, the development of mental representations becomes increasingly complex, and thus are very different from previous findings in which parents' IWMs could significantly predict the infant's security of attachment prior to birth regardless of the infant's temperament (Allen et al., 2004; Allen et al., 2003). In the child's later development, or at least at the adolescent stage, there might be rather complex gene-environment interactions at play affecting the levels of mental

representations. Although there might be different plausible explanations for the genetic effects found on the differentiation-relatedness of self and mother and the internal working models of attachment relationship with mother, the study has identified some potential genetic influences, whether directly or indirectly, on the relational aspect of mental representation of self and significant other in adolescence.

### **Implications of the Genetic Findings**

In light of the polarities model, the findings at this stage may suggest that relatively stronger genetic influences may operate on the relational mental representations of self and significant other whereas genetic effects on self-representation may remain restricted in adolescence. As the mental representation of self-mother predominately emphasizes interpersonal relatedness with significant figures and the self-representation is more concerned about issues of self-definition in relation to a more general sense of relatedness, they broadly correspond to the dimensions of attachment anxiety and attachment avoidance respectively (Blatt & Homann, 1992; Blatt & Maroudas, 1992; Levy et al., 1998; Pilkonis, 1988; Zuroff & Fitzpatrick, 1995). Thus, if similar variance due to genetic effect was found on mental representations in adulthood, the genetic findings in this chapter could in part explain the results of some twin attachment studies (Brussoni et al., 2000; Crawford et al., 2007) in which only the dimension of attachment anxiety showed evidence of consistent heritability but not for attachment avoidance. However, such a theoretical link between mental representations and dimensions of attachment anxiety and avoidance still require further validation as one recent replication study of young adult twins (Picardi et al., 2011) found genetic influences also on attachment avoidance contrasting with the previous studies, especially avoidance of attachment can be further differentiated between patterns of fearful avoidant and dismissive avoidant underlined by different emphasis of self-definition and relatedness. As pointed out in Chapter 2, Section 2.4, fearful avoidant is characterised by both high avoidance and high anxiety in the two polarities dimension, and this might be one of the reasons why mixed results were found for the avoidant dimension in previous studies.

If there were consistent findings of genetic evidence for the mental representation of self and mother or the IWMs of attachment patterns through adolescence to adulthood,

the intergenerational transmission of attachment patterns (Fonagy, Steele, Steele, et al., 1991; Steele et al., 1996; van Ijzendoorn, 1995) and intergenerational transmission of two polarities vulnerability (i.e. anaclitic and introjective characteristics) in previous studies (e.g. Barber et al., 1994; Beebe et al., 2007; Galambos et al., 2003) might be understood differently with the potential casual genetic mechanisms of the mental representations to a certain extent. Unlike the heavy emphasis on the primary causal role of the environmental influences on the development of individual differences in attachment, the causes of most psychopathologies have been recognized to have a dynamic involvement of genetic and environmental factors (Hernandez & Blazer, 2006; Rutter, Moffitt, & Caspi, 2006). Rather than controversial attempts to draw direct links between psychopathology and genes, the gene-environment interaction approach is based on the assumption that environmental pathogens cause disorder and that genes affect susceptibility to pathogens (Caspi & Moffitt, 2006). In other words, heterogeneity of the response to environmental risk factors for psychopathology such as deprivation of parental care during infancy, premature parental loss, childhood maltreatment and stressful life events for psychopathology is associated with pre-existing individual differences in temperament, personality, cognition and autonomic physiology that to a great extent are attributable to genetic effects (Plomin, DeFries, McClearn, & McGuffin, 2001). Based on such a hypothesis, the findings of individual variances in mental representations, at least the relational model of the IWMs, might be viewed as originating in part in the DNA sequence and subsequently result in differences in resilience or vulnerability to the environmental causes of psychopathology. The assumption of genetic moderation in relation to environmental factors in the development of mental representation of self and significant other may provide a more significant and promising link with variations in personality organization as well as many forms of psychopathology especially those personality disorders that are characterized by preoccupation of issues about interpersonal relatedness (see Chapter 2, Sections 2.2.3 and 2.4). This may also further enhance attachment studies on the link between attachment patterns and psychopathology considering that most predictors of attachment security in current attachment studies could be viewed as causal environmental factors (see Chapter 2, Section 2.2.3). As has already been addressed in Chapter 2, one of the most plausible models in studies of developmental psychopathology is to regard attachment security as a protective factor or resilient factor against psychopathology (Svanberg, 1998), and attachment insecurity as a risk factor for

psychopathology (DeKlyen & Greenberg, 2008; Goodwin, 2003; Rutter & Sroufe, 2000), intimately involved with social environment in the development process. As illustrated in a number of studies insecure attachment, disorganized in particular, is more likely to be associated with maladaptive personality functioning in high-risk samples, as insecure attachment can be regarded as a risk factor, which appears to be more salient when other stressors are present in the family ecology (Belsky, 1999; Belsky & Fearon, 2002; Kobak et al., 2006; Shaw et al., 1996).

### **Self-Representation in Adolescence**

One of the significant hallmarks of the CAI-DRS measure is the representation of self in adolescence. There was sparse research focusing on the representation of self prior to adolescent age, compared to extensive research evidence on the representations of self and significant others such as in attachment studies. The heavy emphasis on relational aspects of self and significant others is largely due to the fact that the self is predominately grounded in the attachment relationships at an earlier age and subsequently is only considered an expression of observed aspects in relation to the attachment figures. Therefore, assessment measures of self-representation that are independent from significant attachment figures might not be valid prior to the adolescent age. In adolescence, as the attachment system is developing towards a single overarching attachment representation and the formation of self-identity starts to be more consolidated and gradually stabilized, the assessment of the self-representation might become more meaningful as a strong and independent predictor for children's future behavioural and emotional functioning within and beyond the family context. As already in part demonstrated in Chapters 6 and 7, the maturation of the self-representation in adolescence becomes increasingly critical in personality development as children are progressing towards a more generalized stance towards attachment relationships with parents and starting to establish a more consolidated and comprehensive structure of self-identity. Not only were securely attached adolescents found to have a relatively more advanced level of representation of self (i.e. the differentiation-relatedness of self and others in general) that start to be equivalent as adults, but also the representation of self was reported to be more sensitive

corresponding to symptom dimensions of psychopathology as compared to the mental representation of self-mother or representation of self-father.

The genetic analysis in this chapter added further weight to the differences between the representations of self and the representations of attachment relationships at the transition stage of adolescence. In comparison to the indications of genetic influences on the attachment relationship with mother as well as the differentiation-relatedness of self and mother, no significant genetic effects were found on the mental representation of self. The differences in the degree of variance attributable to genes were striking considering that the correlation between the two was significant at a moderate level ( $r=.56$ ). It should be noted that no indication of heritability in self-representation in this study did not argue against the two polarities model of self-definition and relatedness. The representation of self and parent reflects the degrees of differentiation and integration between self and a primary object in a relationship specific paradigm. While the representations of attachment relationships can be viewed as constant with variations throughout the developmental stages, the emerged self-representation structure in adolescence is considered to be a new and more mature synthesis of the dialectical development process of relatedness and self-definition that will continue to progress to adulthood. In other words, the self-representation in adolescence incorporates previously internalized attachment experiences as well as the self in attachment relationships into a single continuum as a gestalt self-identity (Blatt & Blass, 1990; Erikson, 1968). More importantly, the development of this comprehensive structure of self-representation starts to integrate and consolidate disparate aspects of self in a much wider interpersonal and cultural context as the new cognitive development allows adolescents to appreciate complex abstract internal psychological properties such as value and principles (Blatt, 1995; Blatt & Blass, 1990; Erikson, 1968).

Consistent with Erikson's approach of the development of self-identify within a wider social cultural context (see Chapter 3, Section 3.2) in some ways, Harris (1995) proposed a more radical view that socialization is context specific and socialization outside of home takes place in the peer group especially in adolescence. This approach of group socialization theory views intra and intergroup processes as responsible for the transmission of culture and environmental modification of children's personality characteristics as opposed to the effect of dyadic relationship with parents. In other words, parents have little if any impact on adolescent personality development. Such a

proposition seems extreme, however, it is consistent with the findings in this study that the variance in self-representation structure is mainly attributed to non-shared environmental influences (and measurement errors) but not genetic or shared environmental influences. So far, the results in this chapter suggested that at least in middle adolescence the newly hatched self-representation structure has not yet showed significant evidence of genetic influences. However, as the self-definition and interpersonal relationships continue to evolve and the representation of self tenuously moves towards stabilization, the genetic and environmental effects on the individual variance of self-representation might be subject to change accordingly. It is difficult to infer at this stage whether the genetic factors on the mental representation of self may become increasingly significant as the child develops or the variance attributable to genetic and environmental influences will remain relatively the same beyond adolescence. A further genetic-behavioural study will be required to examine whether there is any genetic influence on the self-representation structure in adulthood.

### **Environmental Influences on Mental Representation of Self and Other**

Besides the potential heritability of the mental representations of self and significant others, another key finding was the substantial non-shared environmental influences, and the effectively zero effect of shared environment found on the mental representations in adolescence. In comparison, past twin studies for children at a much younger age had found significant evidence that approximately half of the variance in attachment security was attributed to shared-environmental factors (Bokhorst et al., 2003; O'Connor & Croft, 2001; Roisman & Fraley, 2008), which was congruent with attachment theory, and that shared variance in maternal sensitivity is a strong predictor of similarity between twins in attachment security, considering that the child's attachment security is believed to be guided by the mother's singular IWM (Fearon et al., 2006) at least in early childhood. However, as indicated by this study and other attachment studies, there is a tendency towards reduced effects of shared environmental influences and increased influences of genetic and non-shared environment on the mental representation of self and significant others (i.e. the IWMs of attachment relationship) in adolescence (Fearon et al., 2013) and in adulthood (Brussoni et al., 2000; Crawford et al., 2007; Picardi et al., 2011). The reduced effect of shared environment on



mental representation may reflect the psychological mechanism shift in adolescence from previous modes of identification, internalization to integration (Blatt & Blass, 1990). It may also imply that the relevant environmental influences unique to each twin become increasingly influential on the child's mental representation of self and others, as the twins grow increasingly different from each other.

Although careful consideration is required to generalize the results to non-twin individuals, the substantial non-shared environmental factors contributing to attachment security in past studies across different age groups (e.g. Bokhorst et al., 2003; Brussoni et al., 2000; Crawford et al., 2007; Fearon et al., 2006; O'Connor & Croft, 2001) were undeniable even taking into account possible measurement errors. As the non-shared environmental factors are considered to account for a substantial degree of the variability in behavioural outcomes (Plomin & Daniels, 1987), this area remains an important subject for future studies. One of the possible non-shared factors (Plomin & Daniels, 1987; Rowe & Plomin, 1981) that should be addressed here is the factor of peer relationships in adolescence. As discussed in Chapter 3, although the primary attachment relationship may still remain important even into adulthood, adolescents begin to have diverse attachment relationships beyond the parent-child attachment relationship (Furman et al., 2002), and more importantly peer relationships and later romantic love gradually start to move up the attachment hierarchies (Fraley & Davis, 1997). Particularly by middle adolescence, it is pointed out that peer relationships gradually take over the attachment functions and start to serve as a crucial source for intimacy, social behaviours and eventually formation of romantic attachment to lifelong partners (Ainsworth, 1989; Collins & Laursen, 2000). Although the working mechanisms and process of the transformation from attachment to parents to peer relationships are still unclear, the growing significance of peer attachment from the theoretical perspective as well as empirical evidence of a strong link between attachment security and adolescents' competence of intimate emotional interactions in close friendships (Allen et al., 2007; Weimer, Kerns, & Oldenburg, 2004; Zimmermann, 2004) have highlighted the crucial role of peer relationships as one of the key non-shared environmental factors that may contribute significantly to understanding the individual differences in the mental representation of self and significant other or attachment security in a child's later development. Since the current study is limited to exploring the specific role of the peer relationship in adolescence, it remains a

potentially valuable research question to test the attribution of peer relationships to the variances in mental representations of self and others especially in later developmental stages.

## **8.5 Conclusion**

With reservation to generalize the findings of this chapter mainly due to somewhat limited statistical power, the study has found some genetic indications on the mental representation of self-mother and self-father whereas the genetic effect on self-representation still remains limited in adolescence. Such results are well congruent with genetic effects found in the main TEDS attachment study in adolescence and some of the attachment studies in adulthood. This may suggest that the mechanisms involved in the relational working models are significantly different from those of early childhood. If consistent genetic evidence were found in later adolescence and in adulthood, it may open up a new perspective from which to understand the intergenerational transmissions of attachment and psychopathology beyond childhood.

## **Chapter 9 Discussion, Conclusion and Future Directions**

### **9.1 Findings and Implications**

Past experiences have taught us the great value of having a multidisciplinary perspective to understand potential causal antecedents and the developmental course of individual differences in personality functioning and psychopathology (Blatt, 1991a, 2008; Blatt & Levy, 2003; Eagle, 1997; Fonagy, 2001; Schore, 2005; Stern, 1985). Following Blatt's integrative approach of the two polarities model in normal and disrupted personality development (see Chapter 1), this thesis adapted the Differentiation-Relatedness Scale (Chapter 4) and to certain extent has examined the reliability (Chapter 5) and validity (Chapter 6 and Chapter 7) of the newly adapted measure CAI-DRS on semi-structure interviews. This thesis has assessed mental representations of self and others in a sample of 160 pairs of same-sex adolescent twins. The study used a classical twin design to examine the behavioural-genetic influences on mental representations of self and other, which might provide us a further understanding of the potential causal factors for individual differences in the representational levels of differentiation-relatedness during adolescence, and subsequently influence our ways of interpreting mechanisms involved in normal and disrupted personality development. Furthermore, this thesis explored the strengths and limitations of measures of mental representation from attachment theory and Blatt's model of mental representation of self and other both in terms of their strengths and limitations. In the study, both attachment measure of Child Attachment Interview and the adapted Differentiation-Relatedness Scales were compared and contrasted in the adolescent twin sample. The attachment results and DRS results were further examined in relation to mother-report psychopathology. This part of the thesis attempted to provide a more integrated and fuller view of understanding the mental representation in middle adolescence.

#### **9.1.1 Reliability and Validity of the CAI-DRS**

In this study sample, the mean level of mental representation of self and other reported is characterized by moving from some rudimentary sense of a differentiated self and some recognition of other as separate with polarized and unintegrated images of self and

other (Level 5) to an emergent, ambivalent constancy and cohesion of self and an emergent sense of relatedness to others (Level 6). This finding is consistent with psychoanalytic theory of middle adolescence (see Chapter 6 Section 6.4), in particular the characteristics of vacillations between the regression to paranoid-schizoid position in early adolescence and a re-emergence of the depressive position in middle adolescence. Therefore, the empirical evidence of this study has supported Blatt's theoretical model of mental representation of self and other at a normative developmental stage of adolescence.

The initial test of the newly adapted manual CAI-DRS had shown good results of inter-rater reliability and internal consistency assessing object representations of self and other on the semi-structure Child Attachment Interviews by a range of coders (Chapter 5). In terms of its discriminative validity, the differentiation-relatedness levels were found to be relatively independent of social-demographic variables of gender, ethnicity and Socioeconomic Status factors including household income, employment status of parents and parental educational level (see Chapter 6). The minor significant effect of father's occupational status found on self-representation and some indication of impact of ethnicity between the predominant culture group and ethnic minorities were discussed.

The concurrent validity of the measure CAI-DRS was tested with the self-report Youth-Inventory and the parent-report symptom inventory. The results were less satisfactory mainly due to the characteristics of the sample in this study. However, the weak correlations between the CAI-DRS and symptom inventory in a normative sample to some extent reflected the limitation of the mental representation that being used in a normative sample. Nevertheless, in comparison to the attachment measures CAI, the self-representation in particular still appeared to be a relatively more significant variable in relation to psychopathology. Lower levels of self-representation were found to significantly correlate to higher risk of psychopathology in symptoms of AD/HD Inattentive, AD/HD combined, Generalized Anxiety, Schizoid Personality Disorder, Schizophrenia, Dysthymia and Bipolar Disorders (Chapter 6).

The convergent validity results showed that the CAI-DRS corresponded to dimensional items of the CAIs to a reasonable degree without indications of significant overlapping and therefore suggested a good convergent validity (Chapter 7). As the CAI-DRS

includes both adaptive functioning levels as well as more primitive and pathological levels of representational models in the clinical spectrum whereas attachment measures focuses more on individual variances in normal development, it is expected that both measures overlapped only to certain degrees. Overall, although current study has certain limitations to well establish the validity of the CAI-DRS measure, the study of the newly adapted measure on semi-structured interviews at this stage showed some good results.

### **9.1.2 Genetic and Environmental Influences on Mental Representation**

Chapter 8 has investigated genetic and environmental effects on individual variance in mental representation of self and representations of self and parent. It was reported that there were indications of approximately 38% heritability in the levels of differentiation-relatedness of self and mother, and 28% in levels of differentiation-relatedness of self and father. The remains of the variance were attributed to non-shared environmental influences and possible measurement errors with no effect of shared environmental influences. No genetic effects or shared environmental influences were found in the differentiation-relatedness of self and others (i.e. a general self-representation). The results of genetic estimates and non-shared environmental influences on mental representation of self-mother in particular were similar to the findings of attachment representation in the main TEDS attachment study (Fearon et al., 2013) as well as previous behavioural-genetic studies of adult romantic love, at least on the anxiety dimensions (Brussoni et al., 2000; Crawford et al., 2007; Picardi et al., 2011).

Some potential interpretations for the genetic effects found on the mental representation of self and mother in adolescence were discussed in Chapter 8. The two primary pathways of how genetic mechanism might be involved are addressed here briefly. One hypothesis is that the manifested heritability on mental representation of self and mother is an outcome of increased genetically influenced person-environment interactions in adolescence. As the IWMs or mental representation of self and mother become more likely to be affected by current quality of family environment during adolescence (Allen et al., 2004; Allen et al., 2003) and genetic influences of evocative correlation or active correlation increase between personality and family environment during adolescence (e.g. Elkins et al., 1997; O'Connor et al., 1998; Pike et al., 1996), the observed genetic

effects on mental representation of self and mother might be attributed to changes of quality of parent-adolescent relationship evoked by the child's genes during the adolescence, which subsequently are manifested in the forms of genetic influences on the mental representation of self and mother. In other words, family environment or quality of current parent-adolescent relationship mediates between child's genetically influenced characteristics and mental representation of self and mother.

The second possible way of interpreting the observed genetic effects on mental representation of self and mother is the psychological mechanisms underlying the process of integration (Blatt & Blass, 1990; Erikson, 1968) in adolescence. As outlined both in attachment theory and psychoanalysis theory, the advent of formal operational thoughts in early adolescence (Inhelder & Piaget, 1958) enables the adolescent to have an increasingly mature mental capacity to reflect and reorganize a more general mental state towards previous attachment experiences including the self in attachment relationships. Furthermore, as noted by Main (1996) as well as research findings in the Minnesota Study of Twins Reared Apart (MISTRA) project (Krueger et al., 2003), an individual's ability to think coherently, to reflect and to integrate early attachment experiences may in part depend on heritable personality traits. Therefore, the genetic evidence observed on the differentiation-relatedness of self and mother as well as on qualities of attachment to mother might reflect certain genetically influenced personality traits mediated by the affective-cognitive mechanisms for integration.

Both models suggest that in later development, or at least at the adolescent age, there are rather complex gene-environment interactions at play affecting the levels of mental representations. Although there might be different plausible explanations for the genetic effects found, this study at this stage has indicated some potential genetic influences, whether directly or indirectly, on mental representation of self and significant other. If there were consistent findings of genetic evidence on the mental representation of self and mother or the IWMs of attachment in adulthood, this finding may yield significant value in interpreting intergenerational transmission of personality vulnerability traits in the two polarities model and intergenerational transmission of attachment patterns as well as psychopathology across generations by taking into account the involvement of genetic mechanisms. However, the genetic evidence found needs to be interpreted with caution.

One of the most important findings in this behavioural-genetic study is that there was no evidence of genetic influences on the differentiation-relatedness of self and others (i.e. self-representation). As reviewed in Chapter 3, Section 3.4.2, due to the nature of pre-adolescent child development and the conceptualization of self predominately embedded in the context of attachment relationship, there is sparse research on adolescent mental representation of self separating from the mental representation of parental figures or working models of attachment relationship. However, as extensive literature has pointed out the centrality of self in adult psychological functioning and in understanding the subjective experiences of patients, it is crucial to investigate development of self-representation in adolescence, especially for the reason that failures of integration into a consolidated self-identity may result in the emergence or consolidation of various psychopathology that can have substantial impact in later adult life. In this study, at least in middle adolescence, the newly emerged self-representation structure seemed to be relatively independent of genetic influences with all the variance attributed to nonshared environment or measurement errors. One may take an extreme view that parents have little if any impact on adolescent personality development. As proposed by Harris (1995) in the new theory of group socialization in adolescence, cultural and environmental modification of children's personality development is regarded as not transmitted by dyadic relationship (i.e. relationship with parents) but through the channel of intra and intergroup processes within peer relationships. The findings of predominately non-shared environment influences on the self-representation in adolescence seem to be quite consistent with Harris' approach that parents have minimal or even no influence on adolescents' personality development. However, this study does not imply that genes will not affect the self-representation at a later stage. So far, the study could only conclude with caution that the self-representation in middle adolescence has not yet shown any significant evidence of genetic influences. Adolescence is the starting point for the new and more mature synthesis of dialectic development of self-definition and interpersonal relatedness, and the construct of self-identity will continue to stabilize and evolve even in adulthood. Accordingly, the genetic and environmental effects on the individual variance in the self-representation might be subject to change in the future. It is difficult to infer at this stage whether the genetic factors on the mental representation of self may become increasingly significant as the child develops or the variance attributable to genetic and environmental influences will remain relatively the same beyond adolescence. A further genetic-

behavioural study will be required to investigate whether there is any genetic influence on the self-representation structure in adulthood.

One remaining point of the behavioural-genetic finding in this study is the substantial non-shared environmental effect and almost no shared-environmental influence found on the self-representation as mentioned and on the representation of self and parent. Referencing behavioural-genetic evidence of attachment security in early childhood, there appears to be a tendency towards a reduced effect of shared environmental influences, and increased influences of genes and non-shared environment on the mental representation of self and significant others in adolescence (Fearon et al., 2013) and in adulthood (Brussoni et al., 2000; Crawford et al., 2007; Picardi et al., 2011). In a way, the difference of environmental influences across age is also consistent with the transformations in psychological mechanisms from internalization, identification to integration in adolescence. Subsequently, adolescents' mental representation is no longer guided by the mother's singular IWM (Allen et al., 2004) as in early childhood (Fearon et al., 2006). Furthermore, as non-shared environmental influences make up a large proportion of individual variance in self-representation and mental representation of self and significant other, and the non-shared environmental factors are considered to account for a substantial degree of the variance in behavioural outcomes (Plomin & Daniels, 1987), this area remains an important subject for future studies, such as peer relationships. In addition, according to previous empirical investigations of parental antecedent on infant-parent attachment, the primary role of early environmental influences on individual differences in attachment security for infants and children in early childhood contains both shared and non-shared environmental components (e.g. Bokhorst et al., 2003; Fearon et al., 2006; O'Connor & Croft, 2001; Roisman & Fraley, 2008). Therefore, despite the indication of minimal shared environmental influences on mental representation of self and other and attachment relationship, parental influences will still remain an important area for research into personality development even beyond later childhood.

Based on current study and previous behaviour-genetic findings in attachment studies, it is still difficult to infer at this stage whether the mechanisms involved in mental representations in adolescence are significantly different from an early age. Despite of remarkable differences in heritability as well as environmental influences, the findings of adolescent mental representation and mental representation in infancy or early



childhood cannot be directly compared mainly due to different attachment measures were used to assess attachment patterns in these behavioural-genetic studies. In the behavioural-genetic studies of attachment reviewed, the assessment measure used for infant attachment is the Strange Situation Procedure (SSP; Ainsworth et al., 1978), which is one of most validated and reliable measures in infancy and early childhood. However, the Strange Situation Procedure is developed to examine infants' behavioural strategies for maintaining proximity to their attachment figures. It is an observation assessment of attachment behaviours that assumed to be based on the internal working models the infants have developed in relation to the primary caregivers. In comparison, the current available behavioural-genetic evidence of adolescent attachment used Child Attachment Interview (CAI; Shmueli-Goetz et al., 2004) which assesses children's representations of attachment security to their parents and their overall state of mind regarding attachment. It is based on the discourse analysis of child's perceived availability of each attachment figure in recent attachment experiences. Even the coherence scale of the CAI for assessing the aspect of adolescent's state of mind regarding overall attachment experience focuses on the discourse usage in terms of degree of realism and integration of attachment relationship in narratives. Similarly the CAI-DRS measuring mental representation of self and other is based on discourse analysis of adolescent's degree of articulation, differentiation, integration as well as empathy and relatedness. Therefore, even though assessment measure of infant attachment and mental representational measures of the CAI and the CAI-DRS are related, the results of findings could not be overgeneralized across ages, for the reason that assessed constructs are conceptually defined and measured differently to some extent. However, it can be speculated with caution that different degrees of variance caused by genetic and environmental factors in mental representation may indicate some developmental differences in the content or structure of mental representation as the child grows. Considering mental representations gradually unfold, evolve and become increasingly complex and stable internal organizations in the developmental process, it is therefore likely that there are different complex genetic-environmental mechanisms at play in mental representations from infancy to adolescence. However, at this stage, this study could only suggest that genes may become increasingly influential on adolescent mental representation of self and mother, and potentially there might be different mechanisms involved in mental representations beyond childhood.

### **9.1.3 Mental Representation, Attachment and Psychopathology**

Although the primary task for children in adolescence is widely recognized as attaining autonomy and growing independence from the family, the study in Chapter 7 has further confirmed the significant role of attachment relationships with parents in the separation-individuation process. The study has found that adolescents with secure attachment to parents have significantly higher levels of mental representation of self and other, self-representation in particular, than insecurely attached adolescents. In a way, the results indicate that secure attachment with parents may facilitate the developmental process in adolescence and warrant adolescents a relatively more mature level of psychosocial functioning that starts to be equivalent to adults. Alternatively, attachment security in adolescence may be a result of developmental levels of mental representation rather than the cause. As demonstrated by Allen and colleagues' cross-sectional study (2003) and two-year longitudinal study (2004), as well as others (also see Allen & Hauser, 1996; Dozier & Kobak, 1992), the security of adolescent attachment is closely associated with the quality of family interaction patterns in the current context. Therefore, the relationship between attachment security and mental representation might be mediated by the quality of family relationships. Levels of mental capacity of differentiation-relatedness may intensify or mediate adolescent conflict of autonomy and relatedness in the process of separation-individuation, qualities of family interactions may subsequently be affected which may in turn manifest in adolescent attachment security.

With respect to psychopathology, the results in this study were rather limited, mostly due to the limited low-risk range in this sample. Nevertheless, it was found that adolescents' attachment security (i.e. secure/insecure) could effectively detect symptom severity difference in Schizoid Personality Disorder, Schizophrenia and Bipolar Disorder to some extent. The correlations between CAI overall coherence scores and the severity scores were only significant in the categories of Schizoid Personality Disorder and Schizophrenia (see Chapter 7). As compared to the CAI coherence or attachment secure/insecure classification, the differentiation-relatedness levels measured on self-description were reported to be a relatively more sensitive construct to capture symptomatology in adolescence. Lower levels of mental representations of self were found more likely to associate with higher risk for psychopathology, especially

symptoms of AD/HD Inattentive, AD/HD combined, Generalized Anxiety, Schizoid Personality Disorder, Schizophrenia, Dysthymia and Bipolar Disorders (see Chapter 6).

This part of the study intended to examine the levels of mental representation of self and other in relation to attachment security, and further to explore whether the developmental levels of mental representation of self and other might serve as a complementary construct to mediate the link between attachment security and psychopathology, especially as the development of self-representation becomes increasingly crucial beyond childhood. However, due to the limitation of the low risk sample, no potential models can be generated. Similarly, even though there was genetic evidence found in adolescent attachment security and on the mental representation of self and significant other, the low risk sample did not permit further investigation of the potential involvement of genetic mechanisms in development of psychopathology. For instance, as reviewed in Chapter 3, Section 3.4.3, the differentiation between these two domains of psychological control (i.e. dependency oriented vs. achievement oriented) in parenting behaviours was considered to mediate the intergenerational transmission of anaclitic and introjective characteristics in parents and adolescents (e.g. Ahmad & Soenens, 2010; Besser & Priel, 2005; Frost et al., 1991; Soenens et al., 2010).

Considering the growing influences of genetic effects on mental representation of self and mother in adolescence, this intergenerational transmission of anaclitic and introjective characteristics may be understood as partially a result of genetic effect. The difference in psychological controlling parenting may also be attributed to parental behaviours evoked by adolescent's increasingly genetically influenced anaclitic or introjective characteristics. Similarly, Besser and Priel's study (2005) of intergenerational transmission of attachment insecurity in three generations of women could also be understood as transmission of introjective vulnerability through the channel of genetically influenced mental representation of self and mother.

As an attempt to integrate attachment theory and object relations theory, the thesis also compared and contrasted the measures of mental representation from attachment theory and Blatt's model of mental representation of self and other. In comparison to the CAI-DRS, the CAI is more limited in differentiating less adaptive levels of mental representations. Not only the correlations between the CAI and symptom inventory are even weaker, but also insecure attachment patterns of the CAI do not differentiate from each other in terms of levels of adaptive or maladaptive functioning. In this study, it

was found that adolescents with Preoccupied attachment have significantly higher levels of differentiation-relatedness than adolescents with Dismissing attachment. This result may suggest at least in adolescence, adolescents with distorted or exaggerated preoccupation of self-definition as expressed in Dismissing attachment were less adaptive than the ones with preoccupation of relatedness expressed in the Preoccupied. Even though adolescence is an important developmental stage for achieving autonomy and individuality, maladaptive exaggerated attempts to separate or to attain autonomy at the expense of the relationship with parents may further delay the normal developmental process of separation and individuation and subsequently yield a great impairment on the formation of self-identity. To a great extent, this study indicated that insecure attachment patterns could be further delineated in terms of their adaptive or maladaptive functioning of levels of differentiation-relatedness. Therefore, the use of mental representation of self and other measure from object relations theory can provide a complementary perspective to attachment measure for differentiating the intricate developmental differences within each of the attachment representational structures. The mental representation measure of self and other from object relations theory outlines a more extensive elaboration of different levels of more primitive and pathological mental representation as well as higher levels of adaptive functioning. In contrast to its wider application in clinical populations, the levels of differentiation-relatedness in a normative sample do not provide further information for individual differences in mental representations. Comparing the distributions of levels of mental representation of self and other and attachment classifications in this sample, attachment measures in this study revealed its value in differentiating distinctive patterns of mental representation in the normative range.

In short, although the study of this thesis cannot generate a more special model linking attachment, mental representation of self and other and psychopathology with the genetic mechanism, the thesis explored the strengths and limitations of the measures of mental representation from attachment theory and object relations theory. It shows both the correlation between the two measures and the unique contributions of each measure in understanding personality development in adolescence. The different emphases of two measures provide complementary perspectives and insights about the development of mental representation in adolescence. Furthermore, by intertwining the two measures

of mental representation from different theoretical perspectives may enrich both theoretical traditions.

#### **9.1.4 the Impact of Twin Relationship in Adolescence**

Chapter 3 reviewed the characteristics of twin relationship in adolescence from the perspectives of psychoanalysis and attachment theory. Although this study was designed for behavioural-genetic investigation, certain preliminary attempts were made to interpret potential impact of twinship on personality development. In Chapter 7, it was found that the degree of reference to the co-twin and the quality of twin relationships perceived in the narrative were congruent with the characteristics of different attachment patterns to parents. Furthermore, the level of co-twin reference in narrative was found to be an even better variable than the self-representation or mental representation of self-parent in significantly differentiating between secure and insecure attachment patterns as well as among secure, preoccupied and dismissing attachment groups. The concordant features between individual twin's attachment pattern and mental representation of twin relationship may suggest that individual twin's attachment relationship with parents may strongly influence their capacity to differentiate and separate self from the other twin as well as the capacity to maintain an essentially positive, reciprocal twin relationship in adolescence. As reviewed in Chapter 3, Section 3.3, the separation-individuation process gives twins an even more heightened vulnerability state than non-twin adolescents, as they face a dual task of separation and some difficulties in this process are inherent in the twinship as early as infancy. Secure attachment to parents may provide twins a stronger base for facing such developmental challenge of separating from each other. Insecure attachment may intensify the conflict of breaking off the object tie to the co-twin, and subsequently affect the process of separating from the other twin and establishing self-identity. However, due to the limitation of cross-sectional study, it is not possible to assume a causal link between the two. As discussed in Chapter 7, it is also plausible to have an individual twin's capacity to separate from the other twin in the separation-individuation process affect the attachment security to parents.

Furthermore, the effect of twin relationship was also tentatively explored through the relationship between one twin's attachment security and the other twin's mental

representations of self (see Chapter 7). It was partially indicated in identical twins that securely attached twins were more likely to have co-twins with higher levels of representation of self, whereas insecurely attached identical twins were more likely to have co-twins with lower levels of self-representation. As discussed in Chapter 7, the effect of an individual twin's attachment relationship on co-twin's mental representations of self might be explained by an indirect effect of concordant attachment patterns caused by genes that subsequently contribute to congruent levels of self-representation. Another potential explanation is that co-twins might potentially serve as attachment figures to mediate the other twins' attachment relationships with parents, based on the assumption of twin attachment (Fraley & Tancredy, 2012; Tancredy & Fraley, 2006), with the decreased reliance on parents as attachment figures, twins may become increasingly important for each other as attachment figures. They may be able to support each other as a secure base during adolescence, just as they can use each other as a transitional object when they are separated from mother (Sandbank, 1999). However, as addressed at the beginning of this section, it was only a very rudimentary attempt to examine the possible effect of twinship on personality development in adolescence. At this stage, no significant conclusion could be drawn.

## **9.2 Limitations of the Study**

For the primary purpose of behavioural-genetic investigation on mental representation, one major limitation in this study is the restricted range of sample demographics including social-cultural, socioeconomic status, and levels of social risk for psychopathology. As summarized in Chapter 6, Section 6.2.1, the predominant ethnic origins of participant twins, over 86% of the whole sample, were white or white British. The families approximately matching the demographics of the main TEDS attachment study were overall more educated, more employable and had higher household income than the national average. Therefore, the results found in this study underrepresented more disadvantageous populations and limited the generalization of the findings. Furthermore, the restricted demographic range had some substantial impact on the validation studies of the CAI-DRS.

Although overall the CAI-DRS was reported to be relatively independent of gender, ethnicity and SES factors, there were some minor indications of social-cultural

differences between the predominant cultural group and ethnic minority groups in the levels of mental representations. However, the number of ethnic minorities in this sample was too small compared to the predominant cultural group to generalize results any further. In terms of the SES factors, there was a relatively small effect of household income and father's occupational status on adolescent's levels of self-representation. Similarly, due to the limitation of this sample the majority of families were in the range of median household income higher than the national average with most of the parents either in full-time or part-time employment (see Chapter 6, Section 6.2.1), making it difficult to draw any conclusions about the impact of the socioeconomic status. Nevertheless, considering the family socioeconomic environment often has direct or indirect effect on child's psychosocial functioning and psychopathology in research studies (e.g. Conger et al., 1999; Edin & Kissane, 2010; Hoff et al., 2002), the minor significant links found in this study may be explained by a secondary effect of socioeconomic factors on the development of mental representation of self (see Chapter 6). The restricted demographic range also substantially affected the concurrent validity of the CAI-DRS. As the sample was a normative sample with very low risk severity scores and the differentiation-relatedness scores obtained were also in a narrow normal range, hardly any linear regression could be formed between the levels of mental representation and the severity of symptoms. As a result, the correlation between the CAI-DRS and the mother-report symptom inventory CASI appeared rather weak. However, as the DRS on the ORI in past studies have demonstrated significant validity in differentiating between psychiatric inpatients and normal controls as well as levels of clinical functioning in seriously disturbed inpatient samples (see Chapter 4), the CAI-DRS might warrant more significant results in relation to psychological functioning in adolescence, providing samples with a wider range of risks for psychopathology. Overall, due to the limitation of the sample characteristics in this study, further validation of the CAI-DRS will be required in more diverse samples with a wider range of social-cultural backgrounds, levels of SES and degrees of psychosocial risk.

In the behavioural-genetic part of the study, there are two main limitations. One is that the sample size in the study was relatively small for behavioural-genetic analysis and therefore caution is always needed when interpreting the results. Although the DZ correlation coefficient was negligibly small for the mental representation of self and father, the coefficient for the mental representation of self-mother was relatively

stronger, however still appeared to be non-significant. By comparing the estimated sample size using statistics simulation for correlation coefficient and referencing to the main TEDS project, it was argued that the non-significant correlation for the differentiation-relatedness of self and mother in the DZ twins was more likely to be caused by insufficient statistical power of the sample rather than sampling error. Moreover, in the ACE model fitting analysis, the sample size was sufficient to reject the model E when dropping the model parameters of A and C. However, there was not enough statistical power to successfully reject the CE model deleting the parameter of additive genetic variance. Nevertheless, the sample size in this study was good enough to determine the best-fitting model of AE and provided a relatively good enough estimation of variances of heritability and non-shared environmental effects that were similarly found in the main attachment study of the TEDS (Fearon et al, 2013). Due to the limitation of statistical power, this study has mostly validated the behavioural-genetic results by referencing the main TEDS behavioural-genetic study on adolescent attachment that used the same, but larger, cohort of participants with sufficient statistical power. Therefore, it should be noted that re-estimation of the genetic and environmental influences on mental representations in a larger sample would be extremely valuable in the future, especially to reject the CE model.

In terms of methodology, there are two issues that need to be addressed. Firstly, the CAI-DRS and the CAI were coded on the same interview materials which means one may question the validity of the results of this whole study. However, as discussed in the literature, the differentiation-relatedness levels are regarded as different developmental levels of the mental representations, which focus more on the representational structure, whereas the attachment measure of the CAI emphasizes the quality of attachment relationships. The coherence scale of the CAI is based on discourse usage in terms of degree of realism and integration of attachment relationship in narratives, which neither links to the developmental process nor identifies differences in the structure of mental representation. Thus, despite some similar aspects in the mental representations assessed by the two dimensions of attachment measures, the differentiation-relatedness scale provides more dynamic, intricate and multi-developmental levels of the representations of self and others in addition to the prototypic attachment patterns. Moreover, the original DRS and the CAI were developed from different theoretical backgrounds and both are well-established



measures with solid reliability and validity. In this study, only certain sections of the attachment interviews were used for the CAI-DRS coding, whereas the primary sections for attachment coding (i.e. episodes in times of distress) were not used. The coding processes of the adapted CAI-DRS and the CAI were rigorously independent, and the raters were blind to both the content and the procedures of the other team. Therefore, based on the theoretical assumptions and the empirical evidence gathered from Chapter 6 and 7, the possibility of measurement errors between the CAI and the CAI-DRS were possible but should be substantially small. In order to establish more solid validity evidence, further studies would be desirable to compare the CAI-DRS with other attachment measures such as questionnaire-based assessments for adolescents (see Chapter 2, Section 2.2.1).

The second limitation of the methodology in this thesis is similar to all other cross-sectional studies. Due to the nature of cross-sectional design, no causal links can be drawn from the results. For instance, individual twins with secure attachment to parents were found to have a significantly more advanced level of representation of self that starts to be equivalent to adults than those with insecure attachment. However, as further discussed in Chapter 7, the results do not indicate that attachment security determines an individual's level of mental representation. It is equally possible that the attachment security with parents might be an outcome rather than the cause of mental representation mediated by current quality of family interactions (see Chapter 7, Section 7.4). Therefore, at this stage, significant relationships found in the thesis need to be carefully interpreted before drawing any conclusions. In terms of quantitative behavioural genetics, it is one of the most powerful methodologies available to detect genetic and environmental influences on behavioural traits. This method not only provides estimates of genetic influences on mental representation of self and other, but also further decomposes the environmental influences to shared and non-shared factors. However, the behavioural-genetic study in this thesis was limited to exploring the interaction between genetic and environmental factors. The results of potential gene-environment interactional effects on mental representation of self and other could only be inferred based on previous studies.

### 9.3 Directions for Future Research

This thesis is a first attempt to assess levels of mental representation of self and representations of self and significant others in adolescence. As reviewed in the literature, self-representation becomes an important construct in normal and disrupted personality development beyond later childhood. The results in this thesis further confirm the value of measuring self-representation in addition to the traditional approach of measuring representations of parents. According to the results in this study, self-representation, that is regarding the self in a more general stance of relatedness with others, in adolescence is sensitive to current attachment security and symptoms of psychopathology even in this very low risk sample. More importantly, behavioural-genetic analysis indicated that self-representation, at least in middle adolescence, was found to have all the variance attributed to nonshared environment and measurement errors, distinct from mental representations of parents. Therefore, although the self in the mental representation of primary relationships has yielded numerous significant findings in previous empirical investigations of adolescent adaptive and maladaptive psychosocial functioning, a separate evaluation of adolescent's developmental levels of self is highly recommend for future research. It is also for future studies to investigate further genetic and environmental influences on mental representation of self in adulthood as self-representation structure gradually moves toward maturity.

The finding of some genetic evidence on mental representations of self-significant others in adolescence is yet another important area for future research. So far, based on evidence from previous empirical attachment research on working models of primary figures in early childhood, adolescence and adulthood, with reservation to overgeneralize the results, this study may indicate that the mechanisms involved in mental representation of self and significant other beyond early adolescence is very different from early stages. Genes as well as environmental factors that are unique to individuals (i.e. non-shared environment) become increasingly influential in personality structure. If consistent genetic-environmental findings were found in mental representation of primary objects in adulthood, the intergenerational transmission of attachment patterns, introjective and anaclitic personality vulnerability and certain psychopathology could be interpreted differently, especially with the involvement of the genetic mechanism. It is also important for future research to investigate and to emphasize the role of non-shared environmental influences on personality development

such as peer relations, as the mental representation of significant others as well as self-representation in adolescence appear to be predominantly affected by non-shared environmental factors. Of course, it does not mean that we should undermine parental influences on child's personality development in adolescence and beyond. As illustrated in some meta-analysis studies and behavioural-genetic studies in infant-mother attachment (see Chapter 1, Section 1.4.2), parental antecedent of infant attachment security is a combined effect of shared and non-shared environmental influences. Therefore, it might well be that those non-shared components of parental influences become increasingly salient in the child's personality throughout the developmental process.

The behavioural-genetic methodology of twin analysis has great advantages, however, as discussed earlier, it also has its limitations. One always has to be cautious when generalizing findings of behavioural-genetic studies to a general population. The reason that this thesis incorporates literature of twin development in psychoanalysis and some attachment studies of twin attachment is to explore the uniqueness of twinship. It has often been assumed that identical and fraternal twins raised in the same family context experience an equivalent environment in behavioural-genetic studies. However, based on psychoanalytic observation and some empirical studies on twin attachment (see Chapter 3, Section 3.3), identical twins are more likely to be treated by others similarly than fraternal twins including parents, teachers and peers. Furthermore, psychoanalytic theorists have often maintained that twins, especially identical twins, have some developmental difficulties inherent in twinship. Therefore, the uniqueness of twins should be noted in future research when interpreting results of twin-design studies.

As twin study designs and statistical analysis methods are also evolving and improving, it is proposed that there will be greater potentials for genetic-behavioural studies on mental representation integrating research from molecular genetics and neuroscience (see Chapter 1, Section 1.4.2). Furthermore, enlightened by the modern approach of gene-environment interactions in personality development, it is always valuable to appreciate the complexity of multiple developmental pathways of mental representation within a wider social-cultural context in future research.

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# **THE CHILD ATTACHMENT INTERVIEW (CAI) PROTOCOL**

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## **CHILD ATTACHMENT INTERVIEW (CAI) PROTOCOL**

( 8 TO 15 YEAR OLDS) (Revised Edition VIII, 15/11/07)

### **INTERVIEW PROTOCOL**

#### **Presenting the interview**

Present the interview by saying:

“This is an interview about you and your family. [Here you can ask whether the child knows what an interview is, and make it clear that you want to know about his/her own point of view about things.] I am going to ask you some questions about yourself first and then I will ask questions about your relationship with your parents. For each question I will ask you to give me some examples. This interview is not a test and there are no right or wrong answers. If for any reason you don't want to answer a question just let me know, and we can skip that one and move to the one. I would just like you to tell me what you and your family are like, from your point of view. The interview will last something like half an hour, maybe a bit more”.

- 1) **Can you tell me about the people in your family?** (May need to qualify by saying “That is the people living together in your house” if child starts describing extended family members. If child only names one parent, ask about 2<sup>nd</sup> parent, how much contact, etc.).

If the child's parents are separated or divorced, ask about step parents. It is important to establish who the child considers to be the primary caregivers and ask all subsequent questions about them. It may mean that you also ask about the step mum or grandmother. If the child is in foster care or has been adopted you need to establish what contact he/she have with his/her biological parents and how long he/she has been in his/her current placement. You might have to ask all questions about the biological parents and the foster parents but you need to hold in mind that the child's attention span has its limits.

This is a warm-up question and it is therefore not aimed at trying to obtain detailed biographical information but rather to establish who are the primary caregivers and to

engage the child in the interview and reduce any anxiety. It is the interviewer's responsibility to choose the main caregivers for the remainder of the interview, guided by the child's description. It is best not to ask the child to choose among the potential attachment figures who he/she consider to be the main ones, as he/she may choose very recent carers who are not very close, or the biological parents who may have not been involved with the child for many.

- 2) **Tell me three words that describe yourself , that is not what you look like, but what sort of person you are (It may be useful to say "that is your personality". Some children may find it helpful to imagine writing a letter to a pen pal, and you can prompt by asking how someone who knows him/her well might describe him/her.).**

1..... 2..... 3.....

- a) Ask for specific examples to support each adjective, i.e., "Can you give me an example of when you felt" 1..... 2..... 3.....

**Prompts:** After each example, prompt the child as appropriate focusing on any specific relationship episodes (See introduction). Remember to insert prompts such as "How did you feel", "How do you think other's felt".

- 3) **Can you tell me three words to describe your relationship with your mum, that is, what it's like to be with your Mum?.**

1..... 2..... 3.....

- a) Ask for specific examples to support each adjective, i.e., "Tell me about a time when you felt 1..... 2..... 3..... with her"

**Prompts:** Immediately after each example prompt the child for more detailed description of the relationship episode as necessary and probes for feeling states (See introduction).

**4) What happens when your Mum gets cross with you or tells you off?**

- a) **Prompt:** If you've done something wrong or done something to make her cross with you, what does she usually say or do? If the child says this has never happened, accept that and move on.

Ask for a specific example, can say "Tell me the last time mum got cross or upset with you".

- b) **How did you feel when that happens?**
- c) **How did you think your mum feels when that happens?**
- d) **Why do you think she does \_\_\_\_\_(whatever the child says mother does, e.g., shouts at you)?**

**Prompts:** If necessary and you think it may help the child to tell the story, you can add prompts such as: Do you know why she tells you off or what you have done wrong? Do you think it's fair? But do not labour these questions so that it gets clearly boring or annoying for the child.

**5) Can you tell me three words to describe your relationship with your Dad, what it's like to be with your Dad?**

1..... 2..... 3.....

- a) Ask for specific examples to support each adjective, i.e., "Tell me about a time when you felt 1..... 2..... 3..... with him"



**Prompts:** Immediately after each example prompt the child for more detailed description of the relationship episode as necessary (See introduction).

**6) What happens when your Dad gets cross with you or tells you off?**

- a) **Prompt:** If you've done something wrong or done something to make him cross with you, what does he usually say or do?

**Ask for a specific example, can say "Tell me the last time mum got upset with you".**

- b) **How did you feel when that happens?**
- c) **How do you think your dad feels when that happens?**
- d) **Why do you think he does \_\_\_\_\_ (whatever the child said father does e.g., shouts at you)?**

**Prompts:** If necessary and you think it may help the child to tell the story, you can add prompts such as: Do you know why she tells you off or what you have done wrong? Do you think it's fair? But do not labour these questions so that it gets clearly boring or annoying for the child.

If after sufficient prompting the child is unable to recount a specific episode, ask the questions in a general manner rather than relation to a specific instance.

***At this point ask same questions about 3<sup>rd</sup> and 4<sup>th</sup> caregivers if you have decided to include someone an additional attachment figure.***

**7) Can you tell me about a time when you were upset and wanted help?**

**Prompt:** Prompt for a specific example when child felt upset or misunderstood - if possible in the family/attachment context. If the child says it has not happened, accept that and carry on.

**8) Do you ever feel that your parents don't really love you?**

**a) Prompt:** Can you tell me when you felt like that?

**b) Do you often feel like that?**

**9) What happens when you're ill? (Give examples if necessary, e.g. had to stay in bed or off school because of an illness)**

**Prompt** for a specific example i.e., "Can you tell me what happened?". What did you do? Does anyone stay at home with you when you're ill?

**10) What happens when you get hurt?**

**Prompt** for a specific example, i.e., "Can you tell me about a time when...?" What did you do? Who was there? Can give examples to make it clear you mean physical accidents, injury etc. If the episode was not at home or with caregivers, ask whether he/she told the parents later, how they reacted etc.

**11) Have you ever been hit or hurt by an older child or a grown up in your family?**

**Prompt** to get information about the incident so that a picture is built up, and about how the child feels about what happened. If the reply is NO, move to the next question.

**a) Did it happen once or twice or more often?**

- b) Can you tell me what happened?
- c) How did you feel?
- d) Have been badly hit or hurt by someone else, outside your family?

**12) (For primary school aged children). Have you ever been touched in the private parts of your body by someone much older than you?**

**(For older children). Have you ever been touched sexually by someone, when you didn't want them to do it?**

Prompt to get as much information as possible. If the reply is NO, move to next question.

- a) Did it happen once or more often?
- b) Can you tell me what happened?
- c) How did you feel?
- d) Do you think \_\_\_\_\_(the person who did it) knew you felt like that?

**1) Has anything else really big happened to you that upset, scared or confused you?**

**2) Has anyone important to you ever died? Has a pet you cared about died?**

- a) What happened? Was the death sudden? Was there a funeral?
- b) How did you feel about it?
- c) How do you think it made other people feel? (e.g. Mum, Dad, sibling?).

**15) Is there anyone that you cared about who isn't around anymore?**

- a) How did it feel when they went away? Did things change much?

**b) Do you keep in touch? If yes, how, if no why do you think that is?**

**If child says no:** Tell me about a time when things changed. (e.g. moved house, went to new school, parents separating, friend left).

**a) How did you feel?**

**b) Do you keep in touch? (If yes,) how, (if no) why do you think that is?**

**16) (For children living with parents) Have you been away from your parents for longer than a day and a night?**

**(For children already separated e.g. in foster home, divorced parents) Do you remember being separated from your Parents/Mum/etc? (If more than one major separation, ask about the one child feels was most difficult, e.g. first foster placement)**

**Prompts:** Prompt to get a clear idea of the incident the child is describing (i.e., When, Who they were with, Where to, How long for, What they did)

**a) What was it like to be away from your parent/s?**

**b) What do you think it was like for your mum and dad?**

**c) (If appropriate) What was it like seeing mum and dad again?**

**17) Do/did your parents sometimes argue?**

**Prompt** for a specific example, can say “Can you tell me about the last time your parents were arguing”

- a) How do you feel? Why do you feel like that?**
- b) Why do you think they do that?**
- c) How do you think they feel?**
- d) Do they know how you feel?**

If parents are separated ask in the past tense. Often children cannot remember and you can then move on to the next question.

**18) How do you get on with your twin?**

- a) Do you argue?
- b) Do you support each other/look out for each other?
- c) Do you hang out together?
- d) What do you think about your twin’s relationship with your mum? How is it different to yours?
- e) What do you think about your twin’s relationship with your dad? How is it different to yours?

**19) a. In what ways would you like to be like your mum?**

**b. In what ways would you not like to be like your mum?**

**c. In what ways would you like to be like your dad?**

**d. In what ways would you not like to be like your dad?**

**20) Ending Question: If you could make three wishes when you are older what would they be?**

Should be asked in playful manner and affirm the child's answers, e.g., "ah, that sounds really good".

**Always end the interview by thanking the child and saying how helpful they've been and that you know that some of the questions are difficult and you really appreciate their help. If the child is distressed make sure that you have clinical backup that you can call upon.**

## **CAI-DRS**

### **ADAPTED DIFFERENTIATION-RELATEDNESS SCALE (DR-S) FOR APPLICATION TO CHILD ATTACHMENT INTERVIEWS**

**DR-S on the Object Relations Inventory was developed by  
Diana Diamond, Sidney J. Blatt, David A. Stayner and Nadine Kaslow  
(copy right Yale University Nov 1998, revised Feb 2012)**

**Adapted by You Zhou, Pasco Fearon and Peter Fonagy  
Aug 2012**

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## Introduction

This manual is intended for use as adjunct to the Differentiation-Relatedness Scale Manual (DR-S; Diamond, Blatt, Stayner & Kaslow, 1998; revised 1995/2010/2012), and specifically adapted for the scoring of sections of the Child Attachment Interviews (CAI; Shumueli-Goetz, Target, Datta & Fonagy, 2004) for assessing the level of differentiation, integration and relatedness of self and significant others. The structure and organization of the DR-S coding in this manual adhere to the original version (Diamond et al, 1998). Thus it is also recommended to be familiar with the coding manual of DR-S on the Object Relations Inventory as well as its theoretical background (Diamond et al, 1998) even though raters can be possibly reliable on this system without first becoming reliable on the Diamond et al (1998) version.

The various developmental levels of relatively enduring mental representations of self and others presented in the DR-S derive primarily from an integration of the developmental psychoanalytic theories of Mahler et al (1975), Jacobson (1976), Mayman & Fraiberg (1969), and Kernberg (1966, 1976) with the theoretical formulations of Blatt (2006, 2008), Loewald (1960, 1978), Kohurt (1971), and Stern (1985), in which psychological development is viewed as progressing simultaneously toward the emergence of a consolidated integrated and individuated sense of **self-definition** (Blatt, 1974; Behrends & Blatt, 1985; Coonerty, 1986) as well as increasingly mature, empathically attuned and reciprocal modes of **interpersonal relatedness** (Stern, 1985; Urist, 1977). The development of self-definition and interpersonal relatedness are assessed as fundamental polarities of personality development that exist in a mutually facilitative, dialectical transaction rather than in parallels (Blatt, 1990, 2008; Blatt and Auerbach, 2003; Blatt & Blass, 1990, 1995; Jordan, 1986; Miller, 1984; Mitchell, 1988; Stern, 1985; Surrey, 1983). The dialectical tension and interaction between these two developmental dimensions facilitates the development of increasingly mature levels of both self-definition and reciprocally attuned relatedness. In constructive psychological development, these representations of self and other become increasingly cohesive, differentiated, and integrated, and begin to reflect an increased sense of empathically attuned, reciprocal interpersonal relatedness. Furthermore, the specification of this synergistic and interactive developmental process of the two polarities provides a broad psychodynamic structural framework that establishes conceptual continuities between personality development, variations in normal personality organization, psychopathology and therapeutic change (more theoretic background reading see Blatt, 2008; Blatt & Luyten, 2009, 2010; Blatt & Shichmann, 1983; Luyten & Blatt, 2011).

In various studies, the DR-S scale has shown good reliability (Stayner, 1992, 1994) and validity (e.g. Kaslow et al., 1998; Levy et al., 1998; Luyten, Meganck, Jansen, De Grave, & Corveleyn, 2006) results in both normative and clinical samples. According to these validation studies, DR-S on ORI narratives was able to differentiate psychiatric patients from normal controls (Luyten, Meganck, Jansen, De Grave, & Corveleyn, 2006), as well as to



discriminate between secularly attached individuals and insecurely attached individuals (Levy et al., 1998). It has also been shown that levels of differentiation-relatedness, especially of the representation of self, correlates significantly with independent assessments of level of clinical functioning in a seriously disturbed inpatient sample (Blatt, Stayner, Auerbach, & Behrends, 1996). In addition, independent assessment of the degree of therapeutic change correlated significantly with increases in the DR-S scores for representations of mother, father, therapist and self (Blatt et al, 1996; Philips, Wennberg, Werbart, & Schubert, 2006; Vermote, Lowyck, Luyten et al., 2010). In a way, changes in levels of DR-S, especially in descriptions of therapist and self seem to be closely related, and were found to uniquely predict therapeutic change (Harpaz-Rotem and Blatt, 2005).

This manual is developed to assess child's differentiation-relatedness on the basis of his or her responses to the Child Attachment Interview (CAI; Shmueli-Goetz, Target, Datta & Fonagy, 2004), which is different from the spontaneous free speech on the ORI. The CAI is a semi-structured interview, in which children are invited to describe their relationships with their primary caregivers (suitable for children aged 7-12 years old, recently extended to adolescent age of 16). The current version of CAI comprises 15 questions, opens with a warm-up question eliciting information relating to family composition, followed by a series of questions tapping the child's self-representation, representations of his or her primary caregivers, times of conflict, distress, illness, hurt, separation, and loss. Throughout the interview, additional probes are used to elicit relevant instances or episodic details. The interviewer also provides scaffolding to assist the child in telling the story, i.e. giving nonspecific, interested comments (more CAI references see Target, Shmueli-Goetz, Fonagy, 2002, 2003; Shueli-Goetz, Target, Fonagy & Datta, 2008). In order to score DR-S on the CAI narrative, only certain sections of the interview are used for coding, mainly the sections of child's self representation and representations of his or her primary givers whereas times of conflict, distress, illness, hurt, separation and loss are not used here.

The scoring system of this manual can be divided into four sections in congruent with the CAI narratives: *Self-description* section where the child is invited to use three words/phrase to describe his or her personality, *Relationship with mum* section and *Relationship with dad* section where the child is probed to use three words/phrases to describe his or her relationship with his/her parents respectively, and in addition, an added section of *twin relationship description*<sup>1</sup> where the child is probed with some general questions regarding his or her relationship with the other twin. Each section of this coding system comprises of 2 or 3 subscales and one DR-S scale (see the outline of scoring system below). Although DR-S is scored separately from other subscales, each of the subscales contributes to assist raters to assign an overall DR-S score in each section.

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<sup>1</sup> The section of the twin relationship is specially added for the purpose of the research project of Twin Early Development Study, it should be noted that the structure of the narrative is different from previous sections of self-description and relationship with parents.

In contrast to the ORI, the CAI questions used for DR-S are more specific and age appropriate. Therefore, the differences between the CAI and the ORI as well as some particular issues regarding the scoring of DR-S on the CAI need to be addressed here. The DR which is evoked on the CAI may differ slightly in a variety of ways from that seen on the ORI (different instances e.g description of physical appearance feature is rare). Unlike ORI, in the self-description section of the CAI, the child is invited to describe his or her personality in three words. Thus some modifications are required for the DR-S, as the form of self-description is somewhat more limited. In other sections, the ORI interview questions and probes are more person-specific ( i.e. "Can you describe your mother/father/therapist?"), whereas in the CAI, the questions are tapping on the relationship specifically ("Can you use three words to describe your relationship with your mum/dad?"). It is argued here relationship descriptions may better capture the developmental level of the person's representation of self and other on the basis of Kernberg's view on important aspects of the individual's personality structure. According to Kernberg (1975; 1976), representations derive from internalized relationships to primary caregivers and such internalized early interpersonal experiences consist of three parts: representation of self, representation of others, and the affective tone characteristic of these relationships between self and other. Thus, by asking about current relationships to primary caregivers, it would probably provide us a closer view of individual's differentiation-relatedness of self and others on a representational level. Furthermore, the probes of CAI also require individual to elicit examples to elaborate on their statements. In a way, examples could clarify individual's statement in their description, which helps arrive at a more accurate DR-S score. For instance, in the ORI narrative, with some seemingly all positive but somewhat more realistic descriptions, it is very difficult to determine whether it is self-other idealizing (level 4 DR-S) when there is no clear indication of static extreme qualities of idealizing. In this circumstance, the authenticity and consistency of a following example is particularly crucial for raters to identify whether the narrative reflects one-sided idealizing of self and other.

The original DR-S is designed to assess open-ended, spontaneous descriptions of self and others as assessed by the ORI. Yet, the aim of this manual is to adapt DR-S to more structured and specific narrative of the CAI. It can also be used with narrative gathered by similar instruments that are targeting at the representations of self and others, such as permit question in Parent Development Interview (PDI, PDI-R; Aber, Slade, Berger, Bresgi, & Kaplan, 1985; Slade, Aber, Berger, Bresgi & Kaplan, 2003) where the participant is asked to use three or five adjectives to describe the relationship with their children, and possibly applicable to certain sections of the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1996). Lastly, it also should be noted that DR-S is one of the measures of self and object representations, along with other measures including the Conceptual Level Scale and the Thematic Content Scale (see Blatt & Auerbach, 2003 for more details).

**Outline of the scoring categories for Object Relation Scale****Section 1 self-description**

1. Mode of description (categorical 1-5)
2. Articulation of self-description (1-9)
3. Self regard (1-9)
4. Differentiation-Relatedness Scale (1-10)

**Section 2 Description of the Relationship with Mum**

5. Articulation of relationship (1-9)
6. Quality of relationship (1-9)
7. DR-S (1-10)

**Section 3 Description of the Relationship with Dad**

8. Articulation of relationship (1-9)
9. Quality of relationship (1-9)
10. DR-S (1-10)

**Section 4 Description of the Relationship with the other twin**

11. Reference to the other twin (1-9)
12. Quality of relationship (1-9)
13. DR-S (1-10)

**Procedures for coding**

The overall aim of this manual is designed to yield *one global DR-S score* on different sections of the CAIs that best accounts for the overall level of the differentiation-relatedness in each description. Other sub-items in each section are developed to contribute to assign an overall DR-S score in that section. Scoring typically proceeds in the following manner:

1. Before coding read through the family background information to familiarize with the child's family composition.
2. Separate the CAI narratives into 4 sections according to the coding system.
3. Read the each section separately. Identify and analyze narrative that relevant to the coding items. Note down any linguistic markers present.
4. Code all the other items in the section except for DR-S. When assigning a score to items of articulation, self-regard/quality of relationship, make sure to find an anchored point where the level of score is neither too high nor too low. Then on the basis of some of the narrative coherence indices and linguistic markers outlined in the manual, decide whether to lower or increase the score.
5. Bearing in mind of the scores of other items, read the section again and assign an overall DR-S score that best matches the predominant level of individual's representations.

**IMPORTANT NOTES:**

- 1) In some cases when very little information is offered and the narrative is considered to be severely impoverished, raters can assign “Cannot Rate” (CR). However this should be carefully considered as sometimes even one or two sentences of response can imply some remarkable features of an individual’s mental representations.
- 2) When scoring DR-S on the CAI narrative, it is important to take into account that frequent further probing in the interview may lead to attributing higher scores comparing with those more spontaneous descriptions. Thus when assigning a DR-S score, raters should be fully aware of those prompts that can reflect the individual’s level of self and/or other representations and those cannot.
- 3) In each section of the narrative codings (i.e. self description, relationship with mum, relationship with dad and relationship with twin), DR-S score is the overall main score while other items are considered to be subscales that could contributed to arrive at a DR-S score. Thus, it is very unlikely, for instance, to have high scores of articulation and quality of object relations but end up with a low DR-S score or to have very low scores of articulation and quality of object relations with an overall high DR-S score.
- 4) It is important to capture some of the linguistic features present in the descriptions as such language markers can not only identify certain specific Differentiation-Relatedness score but also contribute to other items in the manual (e.g. articulation, self-regard and quality of relationship).
  - Rigidity: Rigid and fixed description with an all-encompassing affect or point of view reflects lower-level representations as well as may be present in lower levels of articulation, self-regard and quality of relationship. In contrast, higher-level representations incorporate multiple affects and points of view that are modulated and integrated;
  - Complexity: Various levels of the scale assess an increasing capacity simultaneously to hold and coordinate disparate view or schemas of self and another, with an increasing toleration for ambiguity and an increase use of affective, temporal, and agentic dimensions in the representation of self and others. It might be reflected in lower levels of scores, description may consist of a single, all-encompassing affective descriptor whereas at higher levels, description may well include integrated multiple affects or contain a creative tension between conflicting affects;

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- Time perspective: Similarly, lower level scores may be limited to a single, global time frame, such as “always” or “never”, whereas higher level descriptions might reflect an ability to contain past views and present experience or an ability to integrate past experience in a way that opens up future possibilities.
- 5) Linguistic markers are important, however, it should be aware that they are not determining keys for assigning a particular score. A holistic view of narrative structure and content is more important.
- 6) To code DRs, there are two fundamental aspects need to be taken into account.
- Sense of agency and autonomy: At lower levels of DRs, representations may not reflect a sense of agency over one's own experience but a sense of being controlled by external forces or a sense of being overwhelmed or possessed by another. Higher level representations may reflect a stronger emphasis on choosing and deciding while, at still higher levels, representations may include a sense of choice within the constraints and limits of one's personal or environmental reality. Descriptions at the highest levels may reflect an appreciation of the complex, reciprocal interactions among past and present choices and an awareness of their consequences.
  - Relatedness and Reciprocity: The scale of Differentiation and Relatedness also reflects a trend toward increasingly mutual, empathically attuned, and reciprocal relatedness. At lower levels, the sense of relatedness in representations may consist of being pushed by or invaded by an other, as seen, for instance, in a description consisting of resisting the onslaught of the other who is experienced as bad and destructive. At higher levels, relatedness may be expressed primarily in parallel interactions, in demonstrations/articulations of cooperation and mutuality, in increased understanding of the other's perspective, and in expressions of empathically attuned reciprocity. At the highest levels, descriptions also reflect an increasing sense of participation in complex relational matrices that codetermine perceptions, attributions, and the symbolizations of meaning.

## THE SCORING MANUAL

(Before coding, it is recommended to read through the interview section of family background first in order to get an overview of the family composition.)

### SECTION 1 SELF-DESCRIPTION

Carefully read the interview section of self-description where the interviewee is asked to describe his or her personality with three words/phrases. After reading the narrative two or three times, assign ratings on scales identified below.

#### 1. Mode of description

This scale is concerned with which mode of representation is given the greatest emphasis when describing self. It is rated on a five-point scale indicating 5 different categories and the values of the scores do not reflect a hierarchical order. The final score given should be representative of the predominant mode of the self-description.

##### **1 Physical or demographic properties, overt behavioural features or other descriptors that fail to portray overall personality qualities**

If ANY one of the 3 words that fails to describe personality qualities, a score of 1 will be assigned. It includes descriptors such as mentioning of physical or demographic properties (e.g. "short", "I live in London"), references to physical illness (e.g. "I have ADHD") and overt behavioural features. Here, overt behavioural features refer to what a person does (e.g. 'play football a lot') rather than how a person behaves (personality traits e.g. sporty). Statements of interests and preferences accompanied with concrete descriptions of behaviours or activities are usually considered as behavioural properties, unless later elaborations show such interests and preferences are central for the individual to define his or her characteristics.

##### **2 External Personality traits**

Score 2 refers to the descriptive mode of external personality traits that indicate how the person portrays self with a preference of the external world of behaviors, actions, people and objects (e.g. friendly, caring and sociable). A score of 2 reflects that all three descriptors characterize self with a great emphasis of external personality traits. It should

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be noted that in this category, descriptions of self do not provide an elaborated understanding of the person's internal states.

### **3 Internal Personality traits**

Score 3 refers to self-description that convey a sense of the individual's inner world of thoughts and ideas (e.g. emotional, bored and quite happy). A score of 3 indicates that all three descriptors of self are heavily emphasized on the person's internal thoughts, ideas and feelings even though some external behavioural features or external personality traits may be included or implied in the descriptions. To distinguish between external and internal personality traits is to capture whether or not there is a definite sense of the person's subjective experiences. It is also useful to consider the context or the manner in which a personality trait is described.

### **4 Mixed internal and external modes with a predominant external emphasis on personality traits**

The narrative of three descriptors has a mixed descriptive mode of the external and internal personality traits (see 2 and 3) but overall it has a somewhat more emphasis on external qualities when portraying self. It could be either a combination of two external quality descriptors and one internal descriptor or a mixed expression of both with an external emphasis within the descriptors.

### **5 Mixed modes with a predominant internal trend**

Score 5 is assigned when the narrative of three descriptors has a mixed mode of external and internal personality traits but overall it has a somewhat more emphasis on internal qualities of self. It could be either a combination of two internal quality descriptors and one external descriptor or a mixed expression of both with an internal emphasis within the descriptors.

**NOTE 1:** It is important to look at the three given descriptive words first, however as the whole scale is to capture the predominant mode of description, the emphasis should be placed on the later elaborated narrative. For instance, the descriptive word given might be 2 (e.g. talkative), but the elaborated descriptions is more about expressing internal thoughts and feelings of being constantly worried about others' views, in which case, a score of 3 should be assigned.

**NOTE 2:** Responses following probes of "feel?" do not contribute to internal qualities of personality traits, as such responses lack spontaneity.



## 2. Articulation of Self

This scale measures the articulation and specificity of self in the self-description regardless of the positive/negative qualities of self. The score depends on the extent to which an individual is able to provide detailed description of a distinctive self. The primary concern is the coherence and the complexity of the narrative. When narrative articulation seems to predominately reach a particular level that is specified below however not well consolidated, the even number score below that level should be assigned (*see note 3*).

- 1 **In extreme cases, lack of descriptive words and no examples** (*see note 4 below*). The discourse is largely fragmented, impoverished and sometimes appears to be very difficult to follow. Despite of frequent probing, the person is unable to provide adequate descriptive words or any examples. The individual may show a strong sense of struggle to describe self (e.g. only one or two descriptors given, no examples provided but merely some generalities);
- 2
- 3 **Three descriptive words may be all provided but accompanied descriptions appear to be simple, one-dimensional and sometimes inconsistent.** The narrative appears to have little subtlety or complexity. Prompts and questions elicit one or two limited examples. Even though sometimes all three descriptive words and accompanied examples may be provided, the elaborations of examples are mostly irrelevant or only the same dominant theme is present without any illustrative details. In some cases, the examples are only based on assumptions such as “if...”. Overall the discourse appears to be largely inhibited;
- 4
- 5 **The descriptive words given are simple or somewhat commonly used** (*see note 5*) **and the following examples are still vague in some of the details.** Relatively little difficult to come up with descriptive words, however, prompts are required to elicit relevant and understandable examples. On the whole, self is elaborated in general terms and examples may appear to be vague in some of the details. Narrative with excessive details or unnecessary examples that are irrelevant to the question being addressed should be also assigned this rating even though speech may appear completely fluent;
- 6
- 7 **Particular quality and characteristic of self is specified within the three words and there are adequate elaborations of a distinctive self in different illustrative examples.** Descriptions of self show some depth and examples elaborated are predominantly illustrative. Very occasional prompts are needed to complete the narrative account. Only minor indication of dysfluency or perseveration;
- 8

- 
- 9 Descriptions of self are rich, complex and sometimes even creative.** The person is psychological minded, attending to the subtleties of personality and subjective experiences of self. Discourse is largely spontaneous with fully illustrated examples. Overall, there is evidence of reflectiveness, spontaneity and flexibility in narrative.

**NOTE 3:** In some of the circumstances, raters may consider lowering one point score to an even number score when there may be something in the narrative indicates that it does not quite meet the criteria for the higher odd number score. Some of the following indices although not exhaustive can be used as reference. Please note even though multiple indices may present at the same time in the narrative, only one score point should be lowered.

- a. **Lapses into the second or third person.** When the child constantly lapses into second or third person in his or her responses by using “you” or referring self by name as third person, this is one way to defend against or distance oneself from uncomfortable feelings that have been stirred up. Consistently lapse into the use of second or third person should be penalized one point for narrative incoherence **unless the lapse is fleeting and brief.**
- b. **The use of direct discourse.** When the child uses direct speech to describe feelings or interactions in the examples as a way of replacing the narrative accounting, one score point should be lowered. In some cases, direct discourse can be used as a way of illustrating a point but does not substitute for the most narrative accounting. Therefore raters then need to evaluate the narrative carefully before lowering the score for the use of direct discourse. A useful way is to look at the density and frequency of the use of direct discourse in the child’s description.
- c. **Other indications of incoherence.** Contradictions, inconsistencies, oscillations, irrelevancies, intrusions into or disruptions of the narrative and inappropriate reference to the interviewer (e.g swearing and marking) as well as constant hesitations, excessive/long pauses and speech impediments. It should be noted the latter indications such as excessive/long pauses and speech impediments may need to take into consideration of the child’s physical condition. In addition, response after frequent prompting may also need to be considered to have a lower score.

**NOTE 4:** Score 1 is normally assigned in some extreme cases of severely impoverished narrative. In some occasional instances, when the descriptors of self are unfolded in appropriate and illustrative elaborations, a much higher score should be assigned even though only one or two words are provided.

**NOTE 5:** Simply and commonly used language in score level of 5 refers to some learned or clichéd language within child’s response to the questions where the narrative appears to be canned and unintegrated. (e.g borrowed language such as “introvert” “ADHD” or commonly used “fun”, “funny”). It is important to look at the following examples to see whether these

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words are clear and well integrated in the narrative with an understanding as well as personal experience.

### 3. Self-regard

The scale is primarily concerned with how the individual views self. A low score indicates a negative and self-critical way of viewing self, expressing self-hatred, harsh judgement or neglect of the self. A higher score reflects positive self-regard indicating a stable sense of self with feelings of confidence, strength or success. At a higher level, the positive self is described in a benevolent, accepting, caring way expressing self-esteem. However, the described positive qualities may not necessarily reflect a positive self-regard (see note 6). Both the descriptive words and elaborative examples need to be carefully evaluated.

- 1     **Self-loathing or global badness of self.** Description of self is expressed with helplessness, failure, and self is perceived as all bad without any attempt to modulate (e.g. description of self as “stupid, dumb and idiotic”). It may appear that the negative self is rather extreme and unchangeable;
- 2
- 3     **Some positive elements but overall still grossly malevolent.** The description of self may include some positive aspects of self but rather expressed in a restricted way. These positive elements appear to be overwhelmed by the overall negative qualities and become insignificant. In other instance, all descriptive words and elaborations may be negative but are more modulated and somewhat flexible (e.g. “a little bossy, grumpy and sometimes naughty”);
- 4     **Defensive or bland positive quality** (see note 6 below). All positive qualities however may only reflect one-dimensional, plain positive feature of the self.
- 5     **Neutral description of self.** The descriptors and elaborations are rather neutral without any positive/negative qualities or the positive/negative descriptors are followed by extensive natural elaborations. An evenly polarized distribution of positive and negative qualities can also be considered a score of 5;
- 6
- 7     **Descriptions may have both positive and negative elements but overall have a more positive or hopeful tone.** In general, positive qualities of self predominate in the narrative (e.g. “annoying, unique, amusing”). Negative self might be vaguely expressed or minimized;
- 8
- 9     **Sense of self is experienced as positive and enriching.** Negative aspects of self are well elaborated with acceptance and tolerance. Show great extent of benevolent confidence.

**NOTE 6:** Score 4 is particular designed to capture bland or defensive affective quality (exaggerated one-sidedness showing all good), which is useful to distinguish DR-S level 4

whether individual is polarized at the end of idealizing or denigration. The assessment point of whether to score 4 or 6 above is the authenticity and believability of the narrative account. A helpful way to distinguish whether the positive qualities serve a purpose of defensive blocking or not is to look at the modulation and conditionality of the narrative as well as the substantiality of the elaborations. It is also very important to take into account of the context of such responses and whether any minor contradiction to all-positive qualities may present even if the contradiction is very subtle. Often bland or defensive positive self-regard appears to be simple and one-dimensional, whereas higher scores reflect a multi-facet of the positive self.

#### **4. Differentiation-Relatedness Scale**

This scale indicates individual's level of object relations based on his or her self-description. The 10 scale points below reflect increasing psychological maturity, differentiation and integration. Higher scores of descriptions derive from increasing differentiation, articulation and integration of self-experiences, as well as increasingly mutual, empathically attuned and reciprocal relationships with others. Each level has its unique defining features and acquires its full specific meaning in comparison to other levels. In a dynamic perspective, each level could be viewed as a maladaptive attempt to stabilize self and others in order to maintain some equilibrium. Before attempting to assign a score, read the self-description a few times to familiar with the content and context. It is important to have a gestalt perspective to assign the most appropriate score that can represent individual's developmental level of object relations. The final score given should be a modal score (most common score) that can best capture the predominant developmental trends in a description. In addition, raters need to be attentive to some of the linguistic markers that can identify the features of different levels of differentiation-relatedness (e.g. rigidity, complexity, time perspective, sense of agency as well as relatedness and reciprocity)

##### **Level 1. Self-other boundary compromise (physical).**

##### **Basic physical boundary of representation of self and other is compromised.**

Descriptions at this level are often characterized by severely compromised physical boundaries in which basic bodily cohesion or physical integrity is lacking, breached, or threatened with breakthrough. In other words, the body of self or other may be experienced and described as permeated by or merged with the physical presence or properties of another person or something in the environment. Narratives are often difficult to understand, confused, fragmented and often bizarre and peculiar.

Thoughts and feelings may seem unbounded and lack a firm sense of being anchored in a physically defined, intact, cohesive bodily self. These descriptions tend to reflect a sense of relational barrenness and may depict infusions or broadcasting of people's

thoughts and feelings, as opposed to interpersonal communication, for instance: “My upstairs neighbor watches my dreams on her TV at night when I’m asleep.” These descriptions may appear as psychotic (i.e. marked by thought disorder).

**NOTE 7:** Scores of level 1 are treated as special scores and outweigh others. Two indications of level 1 require that the description to be rated as score 1.

### **Level 2. Self-other boundary confusion (intellectual, affective).**

**Affective and intellectual boundaries of self and other are compromised; emotional reactions are confused. Representations of self and other appear as physically intact, but feelings and thoughts are amorphous, undifferentiated, or confused. Description may consist of a single global impressionistic quality or a flood of details with a sense of confusion and vagueness. It appears to be difficult to form an idea of the described self or the particular relationship.**

Responses at level 2 are characterized by boundary confusion at the level of ideational processes rather than at the concrete or physical level (level 1). Self and other appear physically intact but thoughts and feelings are amorphous, undifferentiated or confused rather than defined and distinguishable.

For instance, a description may consist of a single, global quality, often an action or global impression when describing self (e.g. “living in love and goodness”) or relationships (e.g. “It’s good all the time when I’m with her.”) without any further elaboration. The other in relationships may also be described by naming internal affective states that lack any reference to interpersonal experience or a sense of interpersonal differentiation (e.g. 1 “Unhappy.” [inquiry] “I just know.”; e.g. 2. I dunno, we’re, I think we’re both like really sometimes we have these moments when we don’t even speak we just know what each other like, kind of like, I don’t really know how to explain it, we just kind of know what we’re thinking and we just kind of laugh and sometimes other people don’t get it but we do...). A description may also consist only of a flood of details that fail to portray a distinguishable person to whom one is related interpersonally. A confusion, vagueness, or loss of mooring related to feeling overwhelmed in the attempt to describe self or relationship (e.g. “I don’t know...[Inquiry]...It’s like trying to describe the fog - its everywhere.”) These descriptions reflect a sense of being lost in unformed, undefined, affective-cognitive experiences.

**NOTE 8:** A key linguistic marker of level 2 can be the numerous repetitions of the phrase “I don’t know” “I’m not sure” and the general lack of coherence in any utterance about the self and others. However, regarding a brief response of “I don’t know”, rating may vary according to the context. In some circumstances, this kind of vague description with little inquiry might be seen as an indication of semi-differentiated (level 5) response resulting from defensive blocking (e.g. I don’t know, don’t want to do it). It should be noted, without access to additional clues such as verbal inflection and intonation, observations of nonverbal behavior,

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or elaborations obtained in inquiry, descriptions consisting of an indistinct phrase such as "I don't know," should be considered unscorable.

### **Level 3. Self-other mirroring.**

**Representation is an extension or mirror reflection of self or other. Characteristics of self and other, such as physical appearance or body qualities, or behaviours and traits of character, are virtually identical. The individual talks about the self only in terms of comparison to the other, with use of the traits of the other to define the self, or the other way around when talking about others.**

Descriptions at this level focus almost exclusively on characteristics of self and other that are virtually the same or exactly identical, such as aspects of physical appearance or body shape/size. The emphasis may be on physical or psychological characteristics or both. These characteristics are described as unequivocally alike and often lack contextual specificity or conditionality. There is the sense that the individual is using the traits of the other to define the self. The other is related to as mirror, a self-completing object, or an extension of the self, through which a tenuous sense of consolidation and stability of the representation is maintained (e.g. "We are just like the same...we wear the same clothes, like the same food...").

Although the preponderance of self and other descriptions in this category are based on similarities between self and other, there may also be some insistence on how different the other may be from the self. But in the latter cases it must be clear at this level that the individual is still only talking about the self with reference to the other (e.g. A [twin brother] gets angry easily, but I'm not like that, I'm more...). The mirroring relationship can be expressed either through focus on concrete perceptual aspects of the self and other, or may be extended into the internal world. In such cases the lack of differentiation is captured through descriptions that indicate a failure in the mirroring process, which renders the individual unable to complete a description of self without reference to the other. Individuals might make statements such as "I really can't say, I really can't describe what I'm like, I don't have a good sense of it. You'd have to ask my mother."

**NOTE 9:** As noted above, apart from emphasizing the similarities between self and other, an individual may stress on the differences the other may be from the self. Either way, the individual is attempting to use others to define self by constantly comparing. The application of mirroring can also be extended to define self-other relationship. In such instance, the individual may compare one self-other relationship to another (e.g. when talking about the relationship with mum, constantly comparing the relationship with dad).

**Level 4. Self-other idealization or denigration.**

**Representation of self or other is described in unitary, polarized, idealized or denigrated terms.**

Descriptions at this level are characterized by extreme, exaggerated, one-sided idealization or denigration of self or other. Simply speaking, it appears to be a situation of either-or with no flexibility or conditionality. These descriptions show evidence of polarization with one side of the pole (positive or negative), and without any attempt to integrate. This all-encompassing quality lacks any reference to conditionality or any sense of qualification or modulation (e.g. 1. asked example to describe the work 'it's nice' "Just all the time, she's always like just it's nothing ever bad really, I'd, can't think of." E.g. 2 [mum-good example.] "Um, pretty much all the time because we just, we get along really well. We never ever had a fight about anything. We always agree. And um yeh it's just, it's always good." [Prompt] Um sort of if we are just sort of hanging around the house then we we're always very nice to each other. We don't usually argue about a particular incident or anything, and it's just, it's a happy feeling. And nice to be around that." E.g.3. [when being asked to use 3 words to describe the relationship with mum] "Bad, bad, bad, always get into arguments...mum has arguments arguments with everyone."). Idealization or denigration of the other seems to provide a tenuous sense of consolidation and stability. In some less extreme cases, idealizing language are used with some qualifiers however there is no evidence of the other pole or any attempt to integrate two polarities, a score of 4 self-other idealization will be assigned depending on the substantially of the following examples (see note 12).

**NOTE 10:** Idealization and denigration may at times be included in the same description but will appear as separate static extremes (or part proprieties) of self or other or will lack the oscillation between extremes which is seen at the next level 5. For instance, when talking about negative self, the child lapses into the third person when refereeing to himself/herself.

**NOTE 11:** Descriptions may be rated higher as a 5 when they are largely denigrating but are somewhat more articulated, elaborated or qualified without the static unmodulated quality of a 4. For example, the description, "My father is mostly a bastard. He's usually very self-absorbed" would be rated as a 5.

**NOTE 12:** Positive narrative might be easily fallen into a decision of a score 4 or 6 above depending on whether there is evidence of idealization. If positive statements are later elaborated with authentic and convincing examples, a score of 6 or above should be considered. In these latter cases (level 6 and above), the multi-facet positive statements are integrated as opposed to narrow, bland and often one-dimensional idealized positive statements.

### **Level 5. Semidifferentiation.**

**Representation of self or others is dominated by primitive (extreme) polarization of experiences, and by oscillation between positive and negative representations of self or other. There may also be abruptly strong emphasis on superfluous details, sometimes even out of context, in an attempt to stabilize a tenuous cohesion of self and other experience.**

Descriptions at this level are most often marked by an oscillation between disparate aspects of one's experience of self and other that have been split into dramatically opposed, mutually exclusive polarities with an all-encompassing absolute quality and with no or little sense of contextual influences or temporal perspective. (e.g. [describing a "friendly" relationship with mum] "We don't have many fights, we rarely fall out...[inquiry]...my sister and my mum and dad were having a fight about who fed the guinea pig...I kind of like felt a bit scared and then I came downstairs and my mum was being friendly to me...my mum was threatening to kill the guinea pig..."). In contrast to level 4, however, there is marked oscillation between dramatically opposite qualities. Oscillation between extremes of relatedness might include, for instance, an overwhelming closeness versus an unbridgeable distance, invasive control versus abandonment, or intense rages versus idolizing love (e.g. ["There's a lot of love, we both really love each other but there's more arguments. [Inquiry love?] She just grabs me and starts hugging me, I say get off! ...It's annoying."]). This oscillation may also appear in a preoccupation with issues of control and autonomy. It reflects the intense struggle to preserve a fragile, vulnerable, emerging sense of self from the intrusion of the other. The oscillation between positive and negative descriptors indicates some rudimentary attempts towards integration of polarized qualities, but the descriptors remain extreme and polarized at this level. This may be compared to more modulated contradictory descriptors and to less threatened, more positive emphasis on self-directedness and autonomy, as seen in higher levels.

Descriptions at this level can also include an inordinate emphasis on, or limitation to superfluous details that are irrelevant to the question being addressed (e.g. a sudden shift of topic or flight of ideas). This marked focus is viewed as another expression of an attempt to stabilize tenuous representations of self and other, serving both defensive and adaptive purposes. As also mentioned above at level 2, the defensive dynamic typical of this scale point may appear overtly intense conflict over what, or how much, to reveal in a description. This defensive blocking is seen as an assertion of will or agency, rather than an expression of the sense of confusion or loss of mooring (e.g. answer all the attempt inquiries with "maybe, maybe not" "I'm not telling you.>"). In such cases, an assertive, often abrupt and



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complete refusal to describe self or the relationship with other, or an unwillingness to continue can be scored as a semi-differentiated attempt to define the self or the object.

**NOTE 13:** Vaguely positive or negative descriptions may fall in the 4 to 6 range, and that the rater is often deciding between a 4 or a 6, but not a 5, and so statistically it makes a big difference. It should be aware that at scale point 5, the descriptions could be mostly negative or positive but with some qualifiers, whereas with lower level scale point 4 descriptions are bland and static, and higher level scale point 6 has multifaceted description show some movement towards consolidation and integration of the object. Such that the description of point 5 warrants a higher score than 4 but does not have the sense of striving for integration of a 6.

**Level 6. Emergent, ambivalent constancy and cohesion, and an emergent sense of relatedness.**

Starting from this level, the representations of self and of object are more integrated. However, at this transitional level, unique characteristics of self or the relationships are lacking. Descriptions reflect an emerging consolidation of disparate aspects of self and other, expressed in somewhat more modulated, integrated and stable representations, but are marked by a hesitant, equivocal or ambivalent movement towards this integration and stabilization. Level 6 descriptions may consist simply of a list of appropriate, role conventional characteristics that do not seem to reflect a sense of the uniqueness of the individual or the nature of a relationship. These descriptions may sometimes be banal, clichéd, or somewhat stereotyped, without being unduly polarized in a negative or positive direction. Descriptions at this level are not subject to fluctuations or the need to denigrate or idealize. Thus, relatedness includes an emergent but an equivocal sense of tolerance for and ability to bring together divergent aspects of interpersonal experience. Self-descriptions are often characterized by trial identifications or distinctions that also convey a sense of tentative movement toward a more individuated and cohesive sense of self.

**NOTE 14:** Descriptions that are clichéd, stereotyped or canned would not be scored above a 6. Reliance on canned language should be seen as an attempt to stabilize the concept of the object by resorting to conventional language and concepts. When humor is used in a description, in a more self-assertive and feisty tone, it may still be scored at level 6 if it has a defensive quality, as opposed to a 7, which would require that the use of humor indicate a perspective on the relationship. If a description emphasizes an evolving self, without a clearly consolidated identity or stability, and without evidence of sustaining relationships, even of a unilateral nature, and without evidence of sustaining, well formulated goals and ambitions that are clearly defined or realized, a score point of 6 may be appropriate, rather than a score of 7.

**Level 7. Consolidated, constant (stable) self and other.**

**Representations at this level are integrated, differentiated and modulated.**

**Distinguishing qualities and characteristics are emphasized and there is a sense of tolerance and integration of disparate aspects of self and others. Relationships may be described in unidirectional terms, but there are indications of understanding of others' thoughts, feelings and motivations in depth.**

Descriptions at this level reflect consolidated and stable representations of self and other. Thoughts, feelings, needs, and fantasies are differentiated and more modulated. At this level, representations include an increasing tolerance and integration of disparate aspects of experiences of self and other. Characteristics and qualities are described more conditionally, with some references to temporality and environmental context. These descriptions are often marked by expressions of sympathetic understanding such as attempts to recognize and take into account specific situational factors that can influence another's, or one's own, behavior or viewpoint. Cause and effect relationships are depicted in relatively uncomplicated, largely unidirectional terms. Self-descriptions often emphasize a positive self-assertion, in which the individual's own opinions, interests, and qualities are defined and articulated. Descriptions of the relationships with others also tend to emphasize specific distinguishing qualities and characteristics. The descriptions may have some touches of playfulness and humor, which implies a perspective on the relationship that is lacking at the lower levels. However, if humor is used defensively, then a lower score is indicated. Another important characteristic of descriptions at this level is the emphasis on the completeness of the description. There must be a sense of a coherent, modulated and integrated sense of self and other with possibly the least inquiries in order for the description to be rated as a 7. The inquiry may clarify certain aspects of the description or even bring out others (e.g. sympathetic understanding), but the integrity of the description should be evident in the original response and not primarily dependent on inquiry.

**Level 8. Cohesive, individuated, empathically related self and others in reciprocal relationships.**

**At this level a new dimension is added to the description of self and other as both more uniquely defined and reciprocally related, as opposed to the unidirectional nature at level 7. In addition to a modulated, integrated and coherent portrait of the self and other found in level 7, descriptions are marked by a definite sense of the unique consolidated identity of self and other, by an in depth understanding and relatedness to others, and by a capacity to understand the perspective of others.**

Descriptions at this level reflect a cohesive, nuanced and related sense of self and other in which varied characteristics and qualities are recognized and increasingly integrated. Aspects of the self and other are emphasized that distinguish and define a unique sense of identity. These descriptions often express an interest in understanding and differentiating feelings and motivations through interpersonal contact and communication, often reflecting references to potential or experienced differences between intentions and actual behavior.

These descriptions also include references to using one's own thoughts and feelings to appreciate and understand the other empathically. Behavior is often depicted in ways that suggest a more complex, context-related understanding of cause and effect and an appreciation that a given action may have shades of meaning depending on its context. These descriptions also include a constructive emphasis on a complex balance of independence and dependence in relationships, on career and work choices, and on future directions and possibilities that reflect the experience of an increasingly stable and cohesive sense of identity. These descriptions should also be characterized by an understanding of the reciprocal impact and interaction of self and other. From scale point 7 on, the characteristics of the scale point should be reflected in more relatively spontaneous narrative. The inquiry may amplify the narrative, but the defining characteristics ought to be in the spontaneous description. In addition, the bulk of the narrative should not be canned or clichéd but rather should convey a unique vibrant person or relationship. In sum, descriptions at level 8 are characterized by: 1) a definite sense of the unique consolidated identity of self and other; 2) an in-depth understanding and relatedness to others and a sense of being enriched by relationship to others; 3) a capacity to understand multiple perspectives of self and others; 4) a sense that self and other are well differentiated, so that one is not overly controlled by or dependent on the other to maintain one's sense of identity even when perspectives of self and other diverge.

### **Level 9. Integrative, unfolding self and other in reciprocal relationships.**

At this level, there is a demonstration of a cohesive sense of self and others in reciprocal relationships that transform both the self and the other in complex, continually unfolding ways. In addition to an integrated, cohesive sense of self and other, descriptions at this level are marked by reciprocal affective and intellectual exchanges between self and other, in which the behaviour of one affects the other and each makes a unique contribution to the relationship.

Descriptions at this level include experiences of empathic identification with the other's internal frame of reference and affective experience while maintaining one's own distinct, intact sense of self. These experiences of reciprocal, intersubjective relatedness

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are often experienced as enriching or transforming the self. Descriptions at this level reflect an appreciation that one's sense of self and other is continually unfolding and being articulated in complex, interpersonal matrices. At this level, there is more emphasis on the reciprocal nature of the relationship with others and on the understanding of how the multiple interactions between self and other have shaped the self, as well as how such interactions themselves are shaped overtime and in the context of outside forces. Descriptions should convey not only a multifaceted sense of the unique identity of self and other but also emphasize the reciprocity and intersubjective understanding between self and others.

**Level 10. Integrated, creative constructions of self and other in empathic, reciprocally attuned relationships with conscious recognition of the intersubjective process of constructing meaning and the relational matrices that contribute to evolving sense of self and other.**

In addition to an articulated sense of integration and reciprocal relatedness to which both self and other contribute in a unique way seen at level 9, a further dimension is added in descriptions at level 10: a recognition that one participates in and contributes to the construction of systems of meaning that are interwoven with one's experience of self and other. Descriptions at level 10 reflect an understanding that an individual and a relationship can be regarded from multiple of perspectives. These constructions are supported by an understanding of reality as an unfolding interplay of objective and subjective experience, rather than a series of "facts" existing entirely apart from one's subjective participation. Self and other are depicted as creative constructions. Narratives emerge from intrapersonal and interpersonal experiences and are understood to shape and organize one's perspective on and perception of self-other experience. Descriptions at this level reflect an appreciation of a conscious and creative participation in the intersubjective process of constructing meaning and the relational matrices that contribute to an evolving sense of self and others.

### **Some general notes of DR-S:**

When a description contains elements characteristic of multiple scale points, for example, some disorganization (level 1 or 2), self comparison (level 3), and some oscillation (level 5), the overall scoring should favor the predominant attempt to stabilize the self or the other and take into account the nature of the elements of the scale points in question. For instance, a self description that includes some disorganization and some oscillation among disparate polarized aspects of the object (scale point 5), but on the whole emphasizes similarity with the parent and the preponderance of the description shows an attempt to stabilize the self through identification with the parent ("She is like me", "because we are so alike") should be scored as a 3. In particular, if there is some oscillation among disparate polarized aspects of

the object (scale point 5), but is marked by vagueness or disorganization, this is not a 5 because the oscillation is obfuscated by confusion. As another example, when a description demonstrates some attempt to stabilize a tenuous differentiation between self and other (“I’ve only lived inside my myself...I really have no idea what anyone else thinks”), if the overall tone of the narrative demonstrates confusion, vagueness or incoherence, this statement can reveal a sense of fragility of the self and a refusal to attempt to understand self and others, rather than an obvious effort at differentiation. Key linguistic markers may include repetitions of the phrase “I don’t know,” and the general lack of consistency in any utterance about the self, creating a sense of unmooring, rather than a sense of agency.

This 10 level scale of Differentiation-Relatedness should be considered as an epigenetic developmental scale and each level has its own key features that distinguish it from all other levels. Therefore, a score can be only given when all the criteria for previous levels must have been met. For instance, for a score of 7, the description must be integrated, modulated, and differentiated. A score of 8 requires all the foregoing criteria plus a sense of empathy for self and object. And a score of 9 requires all of the foregoing criteria plus a sense of intersubjective relatedness, and a score of 10 needs further additional criteria of a sense that the description is a creative, self-reflective construction.

## SECTION 2 RELATONSHIP WITH MUM

### 5. Articulation of relationship

This scale measures the articulation and specificity of the relationship with mum regardless of the qualities of the relationship. The score depends on the extent to which an individual is able to provide detailed description of a distinctive relationship. The primary concern is the coherence and the complexity of the narrative. When narrative articulation seems to predominately reach a particular level that is specified below however not well consolidated, the even number score below that level should be assigned (*see note 3 in self-regard section p12*).

- 1 In extreme cases, lack of descriptive words and no examples** (see note 4 p12). The discourse is largely fragmented, impoverished and sometimes appears to be very difficult to follow. Despite of frequent prompting, the person is unable to provide adequate descriptive words or any examples. The individual shows a strong sense of struggle to describe the relationship with mum (e.g. only one or two descriptors

given, no examples provided but merely some generalities). In some circumstances, there is no explicit mention of the relationship with mum in the description despite prompting from interviewer. Mum may be described and elaborated but the relational aspects between mum and self are largely excluded in the narrative.

2

3 **Three descriptive words may be all provided but accompanied descriptions appear to be simple, one-dimensional and sometimes inconsistent.** The relationship is mentioned globally or in a nonspecific way. The narrative appears to have little subtlety or complexity. Prompts and questions elicit one or two limited examples. Even though sometimes all three descriptors and accompanied examples may be provided, the elaborations of examples are mostly irrelevant or only the same dominant theme is present without any illustrative details. In some cases, the examples are only based on assumptions such as “if...”. Overall the discourse appears to be largely inhibited;

4

5 **The descriptive words given are somewhat stereotypical** (see note 15) **and the following examples are still general.** Relatively little difficult to come up with descriptive words, however, prompts are required to elicit relevant and understandable examples. On the whole, the relationship with mum is elaborated in general terms and examples appear to be vague in some of the details. Narrative with excessive details or unnecessary examples that are irrelevant to the question being addressed should be also assigned this rating even though it may appear completely fluent;

6

7 **Particular qualities and characteristics of the relationship are specified and there are adequate elaborations of a distinctive relationship.** Descriptions of the relationship with mum show some depth and examples elaborated are predominantly illustrative. Very occasional prompts are needed to complete the narrative account. Only minor indication of dysfluency or perseveration;

8

9 **Descriptions of the relationship are rich and complex.** The person is psychological minded, attending to the subtleties of personality and subjective experiences of self and others. Discourse is largely spontaneous with fully illustrated examples. Overall, there is evidence of reflectiveness, spontaneity and flexibility in narrative.

**NOTE 15:** Here stereotypical language refers to social clichéd, role-appropriate mother-child language such as loving, caring etc. Unless the examples followed support and illustrate with personal experiences, such statements are considered to be limited expression of the relationship.

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## 6. Quality of relationship

This scale indicates the quality of a relationship according to the content of the descriptions. A low score indicates a primarily negative and malevolent way of viewing the relationship. A higher score reflects a benevolent and modulated way of viewing the relationship. However, the described positive qualities may not necessarily reflect a positive relationship (see note 16). Both the descriptive words and elaborations need to be carefully evaluated.

- 1 The relationship is perceived as all bad without any attempt to modulate.** Descriptions of mum and the relationship are grossly malevolent, with little hope of comfort or kindness.
- 2**
- 3 Descriptions of mum and the relationship may include some positive elements but overall still unpleasant or hostile.** The relationship may appear to be emotional shallow, and the individual may feel painfully alone. The description of mum and the relationship may include some positive aspects but rather expressed in a restricted way. These positive elements appear to be overwhelmed by the overall negative qualities and become insignificant. In other instance, all descriptive words and elaborations may be negative but are more modulated and somewhat flexible as compared to score 1;
- 4 Defensive or bland positive quality** (see note 16 below). All positive qualities however may only reflect one-dimensional, plain positive feature of the relationship.
- 5 Neutral qualities or descriptions of the relationship show evidence of conventional concern.** The descriptors and elaborations are rather neutral without any positive/negative qualities or the positive/negative descriptors are followed by extensive natural elaborations. The content of elaborations may primarily be based on mutual participation in shared activities or merely on self-interest. An evenly polarized distribution of positive and negative qualities can also be considered a score of 5;
- 6**
- 7 Descriptions of mum and the relationship have both positive and negative elements but overall have a positive or hopeful tone.** In general, positive qualities predominate in the narrative. Negative aspects of the relationship might be vaguely expressed or minimized
- 8**
- 9 Relationship is experienced as positive and enriching.** The described relationship is characterized by mutual sharing, interdependence and respect. Negative aspects of the relationship are well elaborated with acceptance and tolerance.

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**NOTE 16:** Score 4 is particular designed to capture bland or defensive affective quality (exaggerated one-sidedness showing all good), which is useful to distinguish DR-S level 4 whether an individual is polarizing the relationship at the end of idealizing or denigration. The assessment point of whether to score 4 or 6 above is the authenticity and believability of the narrative account. A helpful way to distinguish whether the positive qualities serve a purpose of defensive blocking or not is to look at the modulation and conditionality of the narrative as well as the substantiality of the elaborations. It is also very important to take into account of the context of such responses and whether any minor contradiction to all-positive qualities may present even if the contradiction is very subtle. Often bland or defensive positive self-regard appears to be simple and one-dimensional, whereas higher scores reflect a multi-facet of the positive relationship.

## 7. ORI-DRs

1. **Self-other boundary compromise (physical)**  
(Basic physical cohesion or integrity of representations is compromised).
2. **Self-other boundary confusion (intellectual, affective)**  
(Affective or intellectual boundaries are confused, fused, or compromised).
3. **Self-other mirroring**  
(Consolidation and stabilization of representations based on mirroring).
4. **Self-other idealization or denigration (consolidation and stabilization of representations based on unitary, unmodulated idealization or denigration).**
5. **Semidifferentiation (tenuous, semidifferentiated consolidation of representations achieved through primitive splitting or rigid adherence to concrete properties to achieve a tenuous cohesion).**
6. **Emergent, ambivalent constancy and cohesion and an emergent sense of relatedness.**
7. **Consolidated, constant (stable) self and others in essentially unidirectional relationships.**
8. **Cohesive, individuated, empathically related self and other in bidirectional relationships.**
9. **Integrative, unfolding self and other in reciprocal relationships.**
10. **Integrated, creative constructions of self and other in empathic, reciprocally attuned relationships with explicit recognition and appreciation of the intersubjective process of constructing meaning and the relational matrices that contribute to an evolving sense of self and other.**



### SECTION 3 RELATIONSHIP WITH DAD

*(This section is relatively the same as the section 2.)*

#### 8. Articulation of relationship

This scale measures the articulation and specificity of the relationship with dad regardless of the qualities of the relationship. The score depends on the extent to which an individual is able to provide detailed description of a distinctive relationship. The primary concern is the coherence and the complexity of the narrative. When narrative articulation seems to predominately reach a particular level that is specified below however not well consolidated, the even number score below that level should be assigned. Response after frequent prompting needs to be considered to have a lower score.

- 1 In extreme cases, lack of descriptive words and no examples.** The discourse is largely fragmented, impoverished and sometimes appears to be very difficult to follow. Despite of frequent prompting, the person is unable to provide adequate descriptive words or any examples. The individual shows a strong sense of struggle to describe the relationship with dad (e.g. only one or two descriptors given, no examples provided but merely some generalities). In some circumstances, there is no explicit mention of the relationship with mum in the description despite prompting from interviewer. Dad may be described and elaborated but the relational aspects between mum and self are largely excluded in the narrative.
- 2**
- 3 Three descriptive words may be all provided but accompanied descriptions appear to be simple, one-dimensional and sometimes inconsistent.** The relationship is mentioned globally or in a nonspecific way. The narrative appears to have little subtlety or complexity. Prompts and questions elicit one or two limited examples. Even though sometimes all three descriptors and accompanied examples may be provided, the elaborations of examples are mostly irrelevant or only the same dominant theme is present without any illustrative details. In some cases, the examples are only based on assumptions such as "if...". Overall the discourse appears to be largely inhibited;
- 4**
- 5 The descriptive words given are somewhat stereotypical and the following examples are still general.** Relatively little difficult to come up with descriptive words, however, prompts are required to elicit relevant and understandable examples. On the whole, the relationship with dad is elaborated in general terms and examples appear to be vague in some of the details. Discourse is more or less inhibited. Narrative with excessive details or unnecessary examples that are irrelevant to the question being addressed should be also assigned this rating even though it may appear completely fluent;
- 6**

- 
- 7 Particular qualities and characteristics of the relationship are specified and there are adequate elaborations of a distinctive relationship.** Descriptions of the relationship with dad show some depth and examples elaborated are predominantly illustrative. Very occasional prompts are needed to complete the narrative account. Only minor indication of dysfluency or perseveration;
- 8**
- 9 Descriptions of the relationship are rich and complex.** The person is psychological minded, attending to the subtleties of personality and subjective experiences of self and others. Discourse is largely spontaneous with fully illustrated examples. Overall, there is evidence of reflectiveness, spontaneity and flexibility in narrative.

## **9. Quality of relationship (1-9)**

This scale indicates the quality of a relationship according to the content of the descriptions. A low score indicates a primarily negative and malevolent way of viewing the relationship. A higher score reflects a benevolent and modulated way of viewing the relationship. However, the described positive qualities may not necessarily reflect a positive relationship. Both the descriptive words and elaborations need to be carefully evaluated.

- 1 The relationship is perceived as all bad without any attempt to modulate.** Descriptions of dad and the relationship are grossly malevolent, with little hope of comfort or kindness.
- 2**
- 3 Descriptions of mum and the relationship may include some positive elements but overall still unpleasant or hostile.** The relationship may appear to be emotional shallow, and the individual may feel painfully alone. The description of dad and the relationship may include some positive aspects but rather expressed in a restricted way. These positive elements appear to be overwhelmed by the overall negative qualities and become insignificant. In other instance, all descriptive words and elaborations may be negative but are more modulated and somewhat flexible as compared to score 1;
- 4 Defensive or bland positive quality.** All positive qualities however may only reflect one-dimensional, plain positive feature of the relationship.
- 5 Neutral qualities or descriptions of the relationship show evidence of conventional concern.** The descriptors and elaborations are rather neutral without any positive/negative qualities or the positive/negative descriptors are followed by extensive natural elaborations. The content of elaborations may primarily be based on mutual participation in shared activities or merely on self-interest. An evenly

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polarized distribution of positive and negative qualities can also be considered a score of 5;

6

7 **Descriptions of dad and the relationship have both positive and negative elements but overall have a positive or hopeful tone.** In general, positive qualities predominate in the narrative. Negative aspects of the relationship might be vaguely expressed or minimized

8

9 **Relationship is experienced as positive and enriching.** The described relationship is characterized by mutual sharing, interdependence and respect. Negative aspects of the relationship are well elaborated with acceptance and tolerance.

## 10. ORI-DRS

1. **Self-other boundary compromise (physical)**  
(Basic physical cohesion or integrity of representations is compromised).
2. **Self-other boundary confusion (intellectual, affective)**  
(Affective or intellectual boundaries are confused, fused, or compromised).
3. **Self-other mirroring**  
(Consolidation and stabilization of representations based on mirroring).
4. **Self-other idealization or denigration (consolidation and stabilization of representations based on unitary, unmodulated idealization or denigration).**
5. **Semidifferentiation (tenuous, semidifferentiated consolidation of representations achieved through primitive splitting or rigid adherence to concrete properties to achieve a tenuous cohesion).**
6. **Emergent, ambivalent constancy and cohesion and an emergent sense of relatedness.**
7. **Consolidated, constant (stable) self and others in essentially unidirectional relationships.**
8. **Cohesive, individuated, empathically related self and other in bidirectional relationships.**
9. **Integrative, unfolding self and other in reciprocal relationships.**
10. **Integrated, creative constructions of self and other in empathic, reciprocally attuned relationships with explicit recognition and appreciation of the intersubjective process of constructing meaning and the relational matrices that contribute to an evolving sense of self and other.**

## SECTION 4 RELATIONSHIP WITH THE OTHER TWIN

This section is mainly based on the section of the relationship with the other twin, including the description of twin's relationship with parents.

### 11. Reference to the other twin

This scale is concerned with the extent to which the other twin and their relationship are articulated throughout the narrative. To rate this item, all previous sections of descriptions should be referenced including descriptions of self and the relationships with parents. Then read the interview section of the twin relationship carefully.

- 1 **No mention or acknowledgement of the other twin throughout the narrative.** Provide little information of the other twin or the relationship. In previous sections, there is no reference to the other twin at all. Even when talking about some shared activities, there is no sense to include the other twin. In the twin section, individual indicates a strong and evident refusal to mention the other twin or the relationship.
- 2
- 3 **The other twin and their relationship are mentioned globally or in a non-specific way.** Discourse still shows reluctance and hesitance to mention the other twin. Responses may appear simplified. In the previous sections, there is no explicit reference to the other twin unless being asked. In the twin section, there is a sense of struggle to talk about the other twin and their relationship. Description may appear to be rather vague and general. Only limited information is given about the other twin as a separate individual.
- 4
- 5 **Appropriate reference.** In the previous sections, one or two examples may include the other twin only because the twin is also playing a part in the occurring events. Descriptions of the twin's part are relevant to the context and time. The relationship with the other twin is adequately elaborated and specified in the twin section of the interview.
- 6
- 7 **Some uncontained elaborations of the other twin.** In the previous sections, around half of the examples involve the other twin. The narrative may also display features such as the often use of "we" as an entity or some occasional descriptions of the other twin as a comparison when not necessary. In the twin section, the description of the other twin and the relationship is excessively detailed.
- 8
- 9 **Constantly mentioning the other twin throughout the whole narrative without even being asked.** Majority or all examples in the interview involve the other twin. The issues of the other twin or the relationship with the other twin

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become a dominant theme even in the sections where individual is describing self and the relationships with parents. The description of the other twin and the relationship may appear to be overly elaborated in the previous sections and the twin section. There is a strong sense of preoccupation of the other twin and the relationship.

## **12. Quality of relationship**

This scale indicates the quality of a relationship according to the content of the descriptions. A low score indicates a primarily negative and malevolent way of viewing the relationship. A higher score reflects a benevolent and modulated way of viewing the relationship. However, the described positive qualities may not necessarily reflect a positive relationship. Both the descriptive words and elaborations need to be carefully evaluated.

- 1 The relationship is perceived as all bad without any attempt to modulate.**  
Descriptions of the other twin and the relationship are grossly malevolent, with little hope of comfort or kindness.
- 2**
- 3 Descriptions of the other twin and the relationship may include some positive elements but overall still unpleasant or hostile.** The relationship may appear to be emotional shallow, and the individual may feel painfully alone. The description of the other twin and the relationship may include some positive aspects but rather expressed in a restricted way. These positive elements appear to be overwhelmed by the overall negative qualities and become insignificant. In other instance, all descriptive words and elaborations may be negative but are more modulated and somewhat flexible as compared to score 1;
- 4 Defensive or bland positive quality** (see note 16 below). All positive qualities however may only reflect one-dimensional, plain positive feature of the relationship.
- 5 Neutral qualities or descriptions of the relationship show evidence of conventional concern.** The descriptors and elaborations are rather neutral without any positive/negative qualities or the positive/negative descriptors are followed by extensive natural elaborations. The content of elaborations may primarily be based on mutual participation in shared activities or merely on self-interest. An evenly polarized distribution of positive and negative qualities can also be considered a score of 5;
- 6**
- 7 Descriptions of the other twin and the relationship have both positive and negative elements but overall have a positive or hopeful tone.** In general,

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positive qualities predominate in the narrative. Negative aspects of the relationship might be vaguely expressed or minimized

8

- 9 **Relationship is experienced as positive and enriching.** The described relationship is characterized by mutual sharing, interdependence and respect. Negative aspects of the relationship are well elaborated with acceptance and tolerance.

### 13. ORI-DRs

1. **Self-other boundary compromise (physical)**  
(Basic physical cohesion or integrity of representations is compromised).
2. **Self-other boundary confusion (intellectual, affective)**  
(Affective or intellectual boundaries are confused, fused, or compromised).
3. **Self-other mirroring**  
(Consolidation and stabilization of representations based on mirroring).
4. **Self-other idealization or denigration (consolidation and stabilization of representations based on unitary, unmodulated idealization or denigration).**
5. **Semidifferentiation (tenuous, semidifferentiated consolidation of representations achieved through primitive splitting or rigid adherence to concrete properties to achieve a tenuous cohesion).**
6. **Emergent, ambivalent constancy and cohesion and an emergent sense of relatedness.**
7. **Consolidated, constant (stable) self and others in essentially unidirectional relationships.**
8. **Cohesive, individuated, empathically related self and other in bidirectional relationships.**
9. **Integrative, unfolding self and other in reciprocal relationships.**
10. **Integrated, creative constructions of self and other in empathic, reciprocally attuned relationships with explicit recognition and appreciation of the intersubjective process of constructing meaning and the relational matrices that contribute to an evolving sense of self and other**

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Dr P Fearon  
School of Psychology and Clinical Language Sciences

22 April 2015

**Research Ethics Committee Project No. 10/10: The TEDS  
Family Study**

Dear Dr Fearon

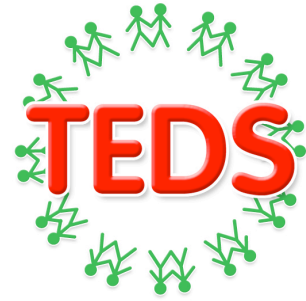
Thank you for your email of 29 June regarding revisions to the above project. I can confirm that the Chair is happy with the changes you have made and the project may proceed.

Yours sincerely,

Tasha Dawson  
Senior Academic Services Administrator  
([n.dawson@reading.ac.uk](mailto:n.dawson@reading.ac.uk) Ext 6181)

cc: Professor M A Gosney (Chair)  
Professor J Ellis, Head of the School of Psychology and  
Clinical Language Sciences

## *Information Sheet for Parents*



# TEDS Family Study

The TEDS study team is embarking on a new study that is looking into the way teenagers' genes influence the relationships they have with other people, particularly their parents, siblings and friends. Adolescence is a particularly important time to understand the contribution that genes make to how teenagers get on with other people, because it is an age when they increasingly impose their own 'stamp' on how their relationships develop, both inside the home and outside of it. The study is a collaboration with researchers at the University of Reading and University College London.

### **What does participation entail?**

The study will take about 1.5 hours of your time in total and would involve us visiting you at your home. The study involves an in-depth interview for each twin, lasting about 30 minutes, in which we will ask them to tell us about their thoughts and feelings about the relationships they have with their family, particularly their parents and their siblings. We are interested in how they think they get on with each other, and with you their parents, and how they find growing up in your family. We are also interested in finding out about how they deal with, and think about, some difficult issues like arguments or discipline, or times when they have been hurt or upset. This interview will be video recorded.

After the interview is finished we would also like to record an example of how each of your children behaves when trying to resolve a problem with their parents. We will ask you to choose a topic that has caused some disagreement in the past and get you to discuss it with each of your children separately for around 10 minutes, while we video record the conversation. Finally, we will also ask the whole family to fill out some questionnaires about their perceptions of their family. Some questionnaires will be just for parents to fill in, and are about how you think your children are doing in terms of their schooling, behaviour and emotions.

### **Who can participate?**

We are inviting all families that have participated in TEDS before who live in the Greater London and Home Counties area to be involved in the study. We would need at least one

parent to be present, but would be delighted if both parents were present if that were possible.

### **What are the possible disadvantages & risks of taking part?**

We do not believe there are any risks involved in taking part in this study. However, because the interviews we conduct are quite personal and are about teenagers' experiences and feelings about their family and friends it is possible that some children could become upset during the interviews. We always make sure that children are reminded that they can always stop the interview whenever they want and that they can skip any questions they don't want to answer without having to explain why. Our interviewers are also carefully trained to be sensitive and professional at all times and will make sure that they respond to any upset in a kind and responsible manner.

### **What are the possible benefits of taking part in this research?**

There are no immediate benefits, but the longer term outcome would benefit potentially many people, as we get a better understanding of how genes influence children's relationships with other people and how this in turn relates to their emotional wellbeing and behaviour.

### **Confidentiality**

**All information that is collected during this study is strictly confidential. No-one other than the TEDS research team will see the video recordings or questionnaires that you and your children provide us with, without your explicit permission. There is only one exception to this rule: by law we are obliged to inform the relevant authorities if during your child revealed that he/she was in imminent serious danger, for example due to maltreatment or because he/she was suicidal. In such a situation we would always inform you before notifying anyone else and would work with you to find the best way to keep your child safe.**

### **What will happen to the results?**

We plan to publish the results in reputable scientific journals. As you know, there is also a TEDS newsletter which you will receive regularly. The results will be posted in the newsletter as well as on the TEDS website. Your family will never be identified individually in the results.

### **Your expenses**

We will give each of your teenage twins a £15 gift token as a thank you.

### **What you should know**

We would like to emphasize that participation in this research is voluntary and does not in any way affect your participation on wider TEDS research. Even if you decide to take part, you can withdraw your child at any time, without giving a reason. Also, as we noted already, all of the information collected and presented as a result of this research is confidential.

## **Where and When will the study take place?**

The visit will take place at your home and can be arranged Monday-Saturday 9.00-18.00.

## **Contact Information**

If you have any questions about this research, the study co-ordinators Jo Mollon and Harriet Mills can be contacted on the TEDS freephone number 0800 999 2402 or by email [josephine.mollon@kcl.ac.uk](mailto:josephine.mollon@kcl.ac.uk) or [harriet.mills@kcl.ac.uk](mailto:harriet.mills@kcl.ac.uk).

You can also contact the Principal Investigators of the research below:

**Dr. Pasco Fearon** (Principal Investigator): School of Psychology and Clinical Language Sciences, University of Reading. Email [p.fearon@reading.ac.uk](mailto:p.fearon@reading.ac.uk). Telephone number: 0118 378 5565. Also contactable at the TEDS office on freephone 0800 999 2401/ 0800 999 2402.

**Dr. Essi Viding**, Research Department of Clinical, Educational and Health Psychology, University College London. Email: [e.viding@ucl.ac.uk](mailto:e.viding@ucl.ac.uk). Telephone: 0207 679 5874. Also contactable at the TEDS office on freephone 0800 999 2401/ 0800 999 2402.

Thank you for reading this information sheet!

With best wishes,

Dr. Pasco Fearon  
Dr. Essi Viding  
And The TEDS Team

## CONSENT FORM

Please tick appropriate box:

- ☐ **Yes**, I would like my children to participate in this study.
  - ☐ **No**, I do not want my children to participate in this study.
  - ☐ **Yes**, I would like to participate in the study.
  - ☐ **No**, I do not wish to participate in the study.
- 

If Yes, please complete the following:

- ☐ I have read the Information Sheet about the TEDS Family study.
  - ☐ I understand that I may withdraw my children from the study at any time without giving a reason.
  - ☐ I understand that my children may withdraw from the study at any time without giving a reason.
  - ☐ I understand that I may withdraw from the study at any time without giving a reason.
  - ☐ I understand that the interviews will be video recorded.
  - ☐ I have had the opportunity to ask any questions I wish to ask.
  - ☐ I have the names and telephone numbers of the research team in case I have any queries in the future.
- 

Parents Name: \_\_\_\_\_ Signature: \_\_\_\_\_

Children's Names: \_\_\_\_\_ Date: \_\_\_\_\_

*Thank you!*

I would describe my children's ethnic origin as:		
<b>Asian or Asian British</b> <input type="checkbox"/> Bangladeshi <input type="checkbox"/> Indian <input type="checkbox"/> Pakistani <input type="checkbox"/> Any other Asian background  <b>Black or Black British</b> <input type="checkbox"/> African <input type="checkbox"/> Caribbean <input type="checkbox"/> Any other Black background	<b>Mixed</b> <input type="checkbox"/> White & Asian <input type="checkbox"/> White & Black African <input type="checkbox"/> White & Black Caribbean <input type="checkbox"/> Any other mixed background  <b>White</b> <input type="checkbox"/> British <input type="checkbox"/> Irish <input type="checkbox"/> Any other White background	<b>Other Ethnic Group</b> <input type="checkbox"/> Chinese <input type="checkbox"/> Any other ethnic group  <b>Other:</b> Please specify..... ..... <input type="checkbox"/> I do not wish to disclose this

**Total Household Income (approximately):**

Less than £10,000 pa	
£10,000- £20,000 pa	
£20,000 - £30,000 pa	
£30,000- £50,000 pa	
£50,000 - £70,000 pa	
£70,000 + pa	

**Who lives in your house?**

**Mum:** Yes No

If not do twins have contact with mum? Yes No

Frequency?	More than once a week	Once a week	Twice a month	Once a month
	Less than once a month	Twice a year	Once a year	Never

**Dad:** Yes No

If not do twins have contact with dad? Yes No

Frequency?	More than once a week	Once a week	Twice a month	Once a month
	Less than once a month	Twice a year	Once a year	Never

**Other Parental Figure:** Yes No (if yes please give details, e.g. step-parent)

**Other:** (e.g. grandparents)

**Siblings:** (please give gender and age)

**PTO**

**Mother's Highest Level of Education:**

None	
GCSE's/ O-levels or equivalent	
A-level or equivalent	
NVQ, HND or equivalent	
Degree	
Postgraduate Degree	
Other (please give details)	

**Father's Highest Level of Education:**

None	
GCSE's/ O-levels or equivalent	
A-level or equivalent	
NVQ, HND or equivalent	
Degree	
Postgraduate Degree	
Other (please give details)	

**Mother's Occupational status: (please tick)**

Employed (Full time)	
Employed (Part time)	
Self-employed	

Unemployed	
Employed, on maternity leave	

**If employed:** What is your job title? \_\_\_\_\_

**Father's Occupational status: (please tick)**

Employed (Full time)	
Employed (Part time)	
Self-employed	

Unemployed	
Employed, on paternity leave	

**If employed:** What is your job title? \_\_\_\_\_





YI

# YOUTH'S INVENTORY - 4R (YI-4R)

## Self Report

Your Name		Date of Birth	
Age	Male	Female	Today's Date

**DIRECTIONS:** Circle which rating best describes your overall behavior.  
Answer each question to the best of your ability.

Group A	Never	Some- times	Often	Very often
A1. I make careless mistakes.	0	1	2	3
A2. I have trouble paying attention.	0	1	2	3
A3. I have trouble following directions.	0	1	2	3
A4. I start things but do not finish them.	0	1	2	3
A5. I have trouble getting organized.	0	1	2	3
A6. I try to avoid doing things that require a lot of concentration like schoolwork and homework.	0	1	2	3
A7. I lose things.	0	1	2	3
A8. I am easily distracted by other things going on.	0	1	2	3
A9. I am forgetful.	0	1	2	3
A10. I am fidgety.	0	1	2	3
A11. I have trouble sitting still.	0	1	2	3
A12. I feel restless and jittery.	0	1	2	3
A13. I have trouble doing things quietly.	0	1	2	3
A14. I am a person who is "on the go".	0	1	2	3
A15. People say that I talk too much.	0	1	2	3
A16. I blurt out the answers to questions before I hear the entire question.	0	1	2	3
A17. I get frustrated when I have to wait my turn to do things.	0	1	2	3
A18. I interrupt others or butt into other people's business.	0	1	2	3
<b>Ax. How often do the behaviors in Group A make it harder to do schoolwork, get along with others, or work on a job?</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>

Group B	Never	Some- times	Often	Very often
B19. I skip school.	0	1	2	3
B20. I stay out at night when I am not supposed to.	0	1	2	3
B21. I lie to get my own way and to get out of doing things.	0	1	2	3
B22. I threaten to hurt people.	0	1	2	3
B23. I start physical fights.	0	1	2	3
B24. I run away from home overnight.	0	1	2	3
B25. I take things when other people are not looking.	0	1	2	3
B26. I destroy other peoples' property.	0	1	2	3
B27. I set fires.	0	1	2	3
B28. I force people to give me their money or things.	0	1	2	3
B29. I break into houses, buildings, or cars.	0	1	2	3
B30. I use a weapon when I fight (bat, bottle, knife, etc.).	0	1	2	3
B31. I try to hurt animals.	0	1	2	3
B32. I try to physically hurt people.	0	1	2	3
B33. I force people into sexual activity.	0	1	2	3
<b>Bx. How often do the behaviors in Group B make it harder to do schoolwork, get along with others, or work on a job?</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>

I

Group C	Never	Some- times	Often	Very often
C39. I lose my temper.	0	1	2	3
C40. I argue with adults.	0	1	2	3
C41. I don't do what adults tell me to do.	0	1	2	3
C42. I try to do things to annoy people.	0	1	2	3
C43. I blame others for my own mistakes.	0	1	2	3
C44. Other people annoy me.	0	1	2	3
C45. I get angry.	0	1	2	3
C46. When I get angry, I take it out on others.	0	1	2	3
<b>Cx. How often do the behaviors in Group C make it harder to do schoolwork, get along with others, or work on a job?</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>

I

Group D	Never	Some- times	Often	Very often
D47. I worry a lot.	0	1	2	3
D48. I have trouble getting myself to stop worrying.	0	1	2	3
D49. I feel nervous.	0	1	2	3
D50. I feel grouchy or cranky.	0	1	2	3
D51. I get real tense and can't relax.	0	1	2	3
D52. I have trouble falling asleep or staying asleep.	0	1	2	3
<b>Dx. How often do the behaviors in Group D make it harder to do schoolwork, get along with others, or work on a job?</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>

I

Group E	Never	Some- times	Often	Very often
E53. I am very afraid of certain things like animals, heights, storms, going places alone, or being "trapped".	0	1	2	3
E54. There are times when my heart pounds a lot and I feel dizzy and shaky and have difficulty breathing.	0	1	2	3
E55. I have really upsetting thoughts and I cannot get them out of my mind.	0	1	2	3
E56. I have habits that I just have to do over and over again like washing my hands, checking to see if locks are locked, or repeating things a set number of times.	0	1	2	3
E57. Really upsetting things have happened to me and they still bother me.	0	1	2	3
E58. I have really bad memories or dreams.	0	1	2	3
E59. I have habits that I cannot control like eye blinking, nose twitching, shoulder shrugging, lip licking, or head jerking.	0	1	2	3
E60. I make sounds that I cannot control like coughing, throat clearing, sniffing, or grunting.	0	1	2	3
E61. I get aches and pains for no reason like headaches or upset stomach.	0	1	2	3
E62. I worry a lot about my health.	0	1	2	3
E63. I get real nervous in social situations.	0	1	2	3
E64. I am really shy when I am around other kids my age.	0	1	2	3

Group G	Never	Some- times	Often	Very often
G65. I get very upset when I have to leave home.	0	1	2	3
G66. I worry that my parents will be hurt or leave home and not come back.	0	1	2	3
G68. I try to avoid going to school in order to stay home with my parent.	0	1	2	3
G69. I worry about being left at home alone.	0	1	2	3
G71. I have nightmares about being left alone.	0	1	2	3
<b>Gx. How often do the behaviors in Group G make it harder to do schoolwork, get along with others, or work on a job?</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>

I

Group H	Never	Some- times	Often	Very often
H73. I prefer to be alone rather than with my family.	0	1	2	3
H74. I prefer to be alone rather than with friends.	0	1	2	3
<b>Hx. How often do the behaviors in Group H make it harder to do schoolwork, get along with others, or work on a job?</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>

I

Group I	Never	Some- times	Often	Very often
I76. I think that people are trying to get me or hurt me.	0	1	2	3
I77. I hear voices talking to me or telling me to do things.	0	1	2	3
I78. My ideas run together and I cannot think clearly.	0	1	2	3
I79. I get really angry and lose control of myself.	0	1	2	3
I80. I laugh or cry at the wrong times.	0	1	2	3
I81. I don't feel like doing things or talking to people.	0	1	2	3
<b>Ix. How often do the behaviors in Group I make it harder to do schoolwork, get along with others, or work on a job?</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>

I

Group K	Never	Some- times	Often	Very often
K84. I feel unhappy or sad.	0	1	2	3
K85. I don't feel like doing anything.	0	1	2	3
K86. I think about death or suicide.	0	1	2	3
K87. I don't like myself.	0	1	2	3
K88. I feel tired, like I don't have any energy to do things.	0	1	2	3
K89. I feel bad that I can't do things as well as other people.	0	1	2	3
K90. I feel that things never work out right.	0	1	2	3
K91. I eat a lot.	0	1	2	3
K92. I sleep a lot.	0	1	2	3
K96. My feelings get hurt very easily.	0	1	2	3
<b>Kx. How often do the behaviors in Group K make it harder to do schoolwork, get along with others, or work on a job?</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>

I

K95. My school grades have really gone down hill ( <i>Circle No or Yes</i> )	No	Yes
K96. In the past year, a very upsetting thing happened to me (parents divorced, friend or relative died, serious accident, etc.)	No	Yes

Group L	Never	Some- times	Often	Very often
L98. I feel very happy.	0	1	2	3
L100. I am very active and busy.	0	1	2	3
L101. I need very little sleep.	0	1	2	3
L102. I talk a lot.	0	1	2	3
L103. I have trouble concentrating.	0	1	2	3
L104. I do reckless and silly things.	0	1	2	3
L105. I jump from one topic to another when I talk.	0	1	2	3
L106. I believe that I can do things that I really cannot do.	0	1	2	3
<b>Lx. How often do the behaviors in Group L make it harder to do schoolwork, get along with others, or work on a job?</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>

I

Group M	Never	Some- times	Often	Very often
M108. I skip meals and eat very little.	0	1	2	3
M109. I worry about getting fat or overweight.	0	1	2	3
M110. I think that I am fat or overweight.	0	1	2	3
<b>Mx. How often do the behaviors in Group M make it harder to do schoolwork, get along with others, or work on a job?</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>

I

Group N	Never	Some- times	Often	Very often
N111. I go on eating binges where I eat a large amount of food in a short period of time.	0	1	2	3
N112. I cannot stop eating or control how much I eat.	0	1	2	3
N113. I use very strict diets, vomiting, laxatives, or extreme exercise to control my weight.	0	1	2	3
N114. I am very concerned about my weight or body.	0	1	2	3
<b>Nx. How often do the behaviors in Group N make it harder to do schoolwork, get along with others, or work on a job?</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>

I

Group O	Never	Some- times	Often	Very often
O115. I smoke tobacco cigarettes.	0	1	2	3
O116. I drink alcohol beverages (beer, wine, liquor).	0	1	2	3
O117. I get into trouble because of alcohol use.	0	1	2	3
O118. I smoke marijuana.	0	1	2	3
O119. I use other illegal drugs (cocaine, glue, speed, LSD, etc.).	0	1	2	3
O120. I get into trouble because of illegal drug use.	0	1	2	3
<b>Ox. How often do the behaviors in Group O make it harder to do schoolwork, get along with others, or work on a job?</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>

I

Group P	Never	Some- times	Often	Very often
P121. I get into arguments with adults.	0	1	2	3
P122. I get real uptight and can't relax.	0	1	2	3
P123. Other people make me angry.	0	1	2	3
P124. I get nervous around other people my age.	0	1	2	3
P125. I don't have energy to do things.	0	1	2	3
P126. I don't go to school when I don't feel like it.	0	1	2	3
P127. I have difficulty concentrating.	0	1	2	3
P128. I don't eat very much.	0	1	2	3

😊 **Thank you!**





# CHILD AND ADOLESCENT SYMPTOM INVENTORY - 4 (CASI-4R)

## Parent Checklist

Youth's Name	Age	Male	Female
Name of person completing this form	Relation to this youth	Date	

**DIRECTIONS:** Circle which rating best describes this youth's overall behavior.  
Answer each question to the best of your ability.

Category A	Never	Some- times	Often	Very often
A1. Does not pay close attention to details or makes careless mistakes	0	1	2	3
A2. Has difficulty paying attention to tasks or activities	0	1	2	3
A3. Does not seem to listen when spoken to directly	0	1	2	3
A4. Has difficulty following through on instructions and fails to finish things	0	1	2	3
A5. Has difficulty organizing work and activities	0	1	2	3
A6. Avoids doing tasks that require a lot of mental effort (schoolwork, homework, etc.)	0	1	2	3
A7. Loses things necessary for activities	0	1	2	3
A8. Is easily distracted by other things going on	0	1	2	3
A9. Is forgetful in daily activities	0	1	2	3
A10. Fidgets with hands or feet or squirms in seat	0	1	2	3
A11. Has difficulty remaining seated when asked to do so	0	1	2	3
A12a. Runs about or climbs on things when asked not to do so	0	1	2	3
A12b. Seems restless or jittery	0	1	2	3
A13. Has difficulty playing or doing things quietly	0	1	2	3
A14. Is "on the go" or acts as if "driven by a motor"	0	1	2	3
A15. Talks excessively	0	1	2	3
A16. Blurts out answers to questions before they have been completed	0	1	2	3
A17. Has difficulty awaiting turn in group activities	0	1	2	3
A18. Interrupts or intrudes on other people's activities	0	1	2	3
<b>Ax. How often do the behaviors in Category A interfere with youth's ability to do schoolwork or get along with others?</b>	0	1	2	3



Category B	Never	Some- times	Often	Very often
B19. Loses temper	0	1	2	3
B20. Argues with adults	0	1	2	3
B21. Defies or refuses to do what you tell him/her to do	0	1	2	3
B22. Does things to deliberately annoy others	0	1	2	3
B23. Blames others for own misbehavior or mistakes	0	1	2	3
B24. Is touchy or easily annoyed by others	0	1	2	3
B25. Is angry and resentful	0	1	2	3
B26. Takes anger out on others or tries to get even	0	1	2	3
<b>Bx. How often do the behaviors in Category B interfere with youth's ability to do schoolwork or get along with others?</b>	0	1	2	3

Category C	Never	Some- times	Often	Very often
C27. Is truant from school	0	1	2	3
C28. Stays out at night when not supposed to	0	1	2	3
C29. Lies to get things or to avoid responsibility ("cons" others)	0	1	2	3
C30. Bullies, threatens, or intimidates others	0	1	2	3
C31. Starts physical fights	0	1	2	3
C32. Has run away from home overnight	0	1	2	3
C33. Has stolen things when others were not looking (e.g., shoplifting)	0	1	2	3
C34. Has deliberately destroyed others' property	0	1	2	3
C35. Has deliberately started fires	0	1	2	3
C36. Has stolen things from others using physical force (e.g., purse snatching, mugging)	0	1	2	3
C37. Has broken into someone else's house, building, or car	0	1	2	3
C38. Has used a weapon when fighting (bat, bottle, knife, etc.)	0	1	2	3
C39. Has been physically cruel to animals	0	1	2	3
C40. Has been physically cruel to people	0	1	2	3
C41a. Has been preoccupied with or involved in sexual activity	0	1	2	3
C41b. Has forced someone into sexual activity	0	1	2	3
<b>Cx. How often do the above behaviors in Category C interfere with youth's ability to do schoolwork or get along with others?</b>	0	1	2	3

Category C (Continued)	Never	Some- times	Often	Very often
42. Engages in illegal or unlawful activities	0	1	2	3
43. Is impulsive or doesn't plan ahead	0	1	2	3
44. Acts recklessly with no concern for safety of self or others	0	1	2	3
45. Irresponsible when it comes to school, work, or money	0	1	2	3
46. Does not seem to care about the pain and suffering he/she causes to other people	0	1	2	3

Category D	Never	Some- times	Often	Very often
D47. Is overconcerned about abilities in school, athletic, work, or social activities	0	1	2	3
D48. Has difficulty controlling worries	0	1	2	3
D49. Acts restless or edgy	0	1	2	3
D50. Is irritable for most of the day	0	1	2	3
D51. Is extremely tense or unable to relax	0	1	2	3
D52. Has difficulty falling asleep or staying asleep	0	1	2	3
<b>Dx. How often do the behaviors in Category D interfere with youth's ability to do schoolwork or get along with others?</b>	0	1	2	3

Category E	Never	Some- times	Often	Very often
E53. Is overly fearful or tries to avoid specific objects or situations (animals, heights, storms, insects, going places alone, being "trapped," etc.)	0	1	2	3
E54. Complains about heart pounding, shortness of breath, feeling dizzy, trembling, or fear of dying	0	1	2	3
E55. Cannot get distressing thoughts out of his/her mind (worries about germs or doing things perfectly, etc.)	0	1	2	3
E56. Feels compelled to perform unusual habits (hand washing, checking locks, repeating things a set number of times)	0	1	2	3
E57. Has experienced an extremely upsetting event and continues to be bothered by it	0	1	2	3
E58. Has distressing memories or dreams about an extremely upsetting event	0	1	2	3

Category E (Continued)	Never	Some- times	Often	Very often
E59. Makes twitching or jerking movements for no apparent reason (eye blinking, nose twitching, grimacing, lip licking, head jerking, etc.)	0	1	2	3
E60. Makes vocal sounds for no apparent reason (coughing, throat clearing, sniffing, grunting, etc.)	0	1	2	3
E61. Complains about physical problems (headaches, upset stomach, etc.) for which there is no apparent cause	0	1	2	3
E62. Worries about physical health	0	1	2	3

Category F	Never	Some- times	Often	Very often
F63a. Tries to avoid contact with strangers; abnormally shy	0	1	2	3
F63b. Is more anxious in social situations than most other youths	0	1	2	3
F64. Is excessively shy with peers	0	1	2	3
F64a. When put in an uncomfortable social situation, child cries, freezes, or withdraws from interacting	0	1	2	3
<b>Fx. How often do the behaviors in Category F interfere with youth's ability to do schoolwork or get along with others?</b>	0	1	2	3

Category G	Never	Some- times	Often	Very often
G65. Gets very upset when he/she expects to be separated from home or parents	0	1	2	3
G66. Worries that parents will be hurt or leave home and not come back	0	1	2	3
G67. Worries that some disaster (getting lost, kidnapped, etc.) will separate him/her from parents	0	1	2	3
G68. Tries to avoid going to school in order to stay home with parent	0	1	2	3
G69. Worries about being left at home alone or with a sitter	0	1	2	3
G70. Afraid to go to sleep unless near parent	0	1	2	3
G71. Has nightmares about being separated from parent	0	1	2	3
G72. Complains about feeling sick when he/she expects to be separated from home or parents	0	1	2	3
<b>Gx. How often do the behaviors in Category G interfere with youth's ability to do schoolwork or get along with others?</b>	0	1	2	3

Category H	Never	Some- times	Often	Very often
H73. Prefers to be alone rather than with friends or family	0	1	2	3
H74. Shows little interest in having close relationships	0	1	2	3
H75. Is emotionally cold or indifferent toward people	0	1	2	3
<b>Hx. How often do the behaviors in Category H interfere with youth's ability to do schoolwork or get along with others?</b>	0	1	2	3

Category I	Never	Some- times	Often	Very often
I-76. Wets bed at night	0	1	2	3
I-77. Wets or soils underwear during daytime hours	0	1	2	3

Category J	Never	Some- times	Often	Very often
J78. Has strange ideas or beliefs that are not real (food is poisoned, people are trying to get him/her, etc.)	0	1	2	3
J79. Has auditory hallucinations (hears voices talking to or telling him/her to do things, etc.)	0	1	2	3
J80a. Has extremely strange and illogical thoughts or ideas	0	1	2	3
J80b. Has disorganized speech (ideas don't make sense, thoughts run together, loses train of thought, etc.)	0	1	2	3
J81a. Does extremely odd things (excessive preoccupation with fantasy friends, talks to self in a strange way, etc.)	0	1	2	3
J81b. Behaves in extremely strange ways (unpredictable outbursts, acts as if in slow motion, seems to forget how to take care of self, etc.)	0	1	2	3
J82. Laughs or cries at inappropriate times or shows no emotion in situations where most others of same age would react	0	1	2	3
J83. Seems to have lost interest in doing things or talking to people	0	1	2	3
<b>Jx. How often do the behaviors in Category J interfere with youth's ability to do schoolwork or get along with others?</b>	0	1	2	3

Category K: Does this youth have periods lasting at least several days where he/she does the following:	Never	Some- times	Often	Very often
K84. Is depressed for most of the day	0	1	2	3
K85. Shows little interest in (or enjoyment of) pleasurable activities	0	1	2	3
K86. Talks about death or suicide	0	1	2	3
K87. Feels worthless or guilty	0	1	2	3
K88. Has low energy level or is tired for no apparent reason	0	1	2	3
K89. Has little confidence, feels inferior to others, or is very self-conscious	0	1	2	3
K90. Feels that things never work out right	0	1	2	3
<b>Kx. How often do the behaviors in Category K interfere with youth's ability to do schoolwork or get along with others?</b>	0	1	2	3

K91. Has experienced a big change in his/her normal appetite or weight ( <b>circle No or Yes</b> )	<b>No</b>	<b>Yes</b>
K92. Has experienced a big change in his/her normal sleeping habits (trouble sleeping or sleeps too much)	<b>No</b>	<b>Yes</b>
K93. Has experienced a big change in his/her normal activity level (overactive or inactive)	<b>No</b>	<b>Yes</b>
K94. Has experienced a big change in his/her ability to concentrate or make decisions	<b>No</b>	<b>Yes</b>
K95. Has experienced a big drop in school grades or schoolwork	<b>No</b>	<b>Yes</b>
K96. Has become more sensitive or tearful than usual	<b>No</b>	<b>Yes</b>
K97. Has experienced a very stressful event such as parents divorce, death of a friend or relative, serious illness	<b>No</b>	<b>Yes</b>

Category L: Does this youth have periods lasting at least several days where he/she does the following:	Never	Some- times	Often	Very often
L98. Is much more cheerful than usual	0	1	2	3
L99. Is much more irritable or explosive than usual	0	1	2	3
L100. Becomes much more active or busy than usual	0	1	2	3
L101. Needs far less sleep than usual	0	1	2	3
L102. Is much more talkative than usual	0	1	2	3
L103. Is far more distractible than usual	0	1	2	3
L104. Does far more reckless or silly things than usual	0	1	2	3
L105. Switches rapidly from one topic to another	0	1	2	3
L106. Believes that he/she has special abilities or can do things that are obviously unrealistic	0	1	2	3
<b>Lx. How often do the behaviors in Category L interfere with youth's ability to do schoolwork or get along with others?</b>	0	1	2	3

Category M	Never	Some- times	Often	Very often
M107. Has a peculiar way of relating to others (avoids eye contact, odd facial expressions or gestures, etc.)	0	1	2	3
M108. Does not play or relate well with other children	0	1	2	3
M109. Not interested in making friends	0	1	2	3
M110. Is unaware or takes no interest in other people's feelings	0	1	2	3
M111. Has a significant problem with language	0	1	2	3
M112. Has difficulty making socially appropriate conversation	0	1	2	3
M113. Talks in a strange way (repeats what others say; confuses words like "you" and "I"; uses odd words or phrases, etc.)	0	1	2	3
M114. Is unable to "pretend" or "make believe" when playing	0	1	2	3
M115. Shows excessive preoccupation with one topic	0	1	2	3
M116. Gets very upset over small changes in routine or surroundings	0	1	2	3
M117. Makes strange repetitive movements (flapping arms, etc.)	0	1	2	3
M118. Has strange fascination for parts of objects	0	1	2	3
<b>Mx. How often do the behaviors in Category M interfere with youth's ability to do schoolwork or get along with others?</b>	0	1	2	3

Category N	Never	Some- times	Often	Very often
N119. Unusually thin or underweight	0	1	2	3
N120. Refuses to eat enough food to keep a healthy body weight	0	1	2	3
N121. Has excessive worries about getting fat or becoming overweight	0	1	2	3
N122. Thinks he/she is fat or overweight but really isn't	0	1	2	3
<b>Nx. How often do the behaviors in Category N interfere with youth's ability to do schoolwork or get along with others?</b>	0	1	2	3

Category O	Never	Some- times	Often	Very often
O123. Has eating binges (eats an excessive amount of food in a short period of time)	0	1	2	3
O124. Cannot stop eating or control how much he/she eats	0	1	2	3
O125. Uses very strict diets, vomiting, laxatives, or excessive exercise to control weight	0	1	2	3
O126. Seems overconcerned about his/her weight or figure	0	1	2	3
<b>Ox. How often do the behaviors in Category O interfere with youth's ability to do schoolwork or get along with others?</b>	0	1	2	3

Category P	Never	Some- times	Often	Very often
P127. Smokes tobacco cigarettes	0	1	2	3
P128. Drinks alcohol beverages (beer, wine, spirits, liquor)	0	1	2	3
P129. Gets into trouble because of alcohol use	0	1	2	3
P130. Smokes marijuana	0	1	2	3
P131. Uses other illegal drugs (cocaine, glue, speed, LSD, etc.)	0	1	2	3
P132. Gets into trouble because of illegal drug use	0	1	2	3
<b>Px. How often do the behaviors in Category P interfere with youth's ability to do schoolwork or get along with others?</b>	0	1	2	3

Category Q	Never	Some- times	Often	Very often
Q133. Grabs things from other youths	0	1	2	3
Q134. Throws things at other youths	0	1	2	3
Q135. Smashes or destroys things	0	1	2	3
Q136. Gives dirty looks or makes threatening gestures to other youths	0	1	2	3
Q137. Curses at or teases other youths to provoke conflict	0	1	2	3
Q138. Damages other youths' property	0	1	2	3
Q139. Hits, pushes, or trips other youths	0	1	2	3
Q140. Threatens to hurt other youths	0	1	2	3
Q141. Engages in physical fights with other youths	0	1	2	3
Q142. Annoys other youths to provoke them	0	1	2	3
<b>Qx. How often do the behaviors in Category Q interfere with youth's ability to do schoolwork or get along with others?</b>	0	1	2	3

**Thank You!**

R143. Was this youth ever evaluated for special education services?	<b>No</b>	<b>Yes</b>
R144. Did this youth ever get special education services?	<b>No</b>	<b>Yes</b>
R145. Is this youth currently getting special education services?	<b>No</b>	<b>Yes</b>
R146. Did this youth ever get professional help for emotional or behavioral problems?	<b>No</b>	<b>Yes</b>
R147. Did this youth ever take medication for emotional or behavioral problems?	<b>No</b>	<b>Yes</b>
R148. Is this youth currently taking medication for emotional or behavioral problems?	<b>No</b>	<b>Yes</b>

Chapter 4

Chart 4.1 Q-Q Plot of the Differentiation-Relatedness Scale on Self-Description for Normality

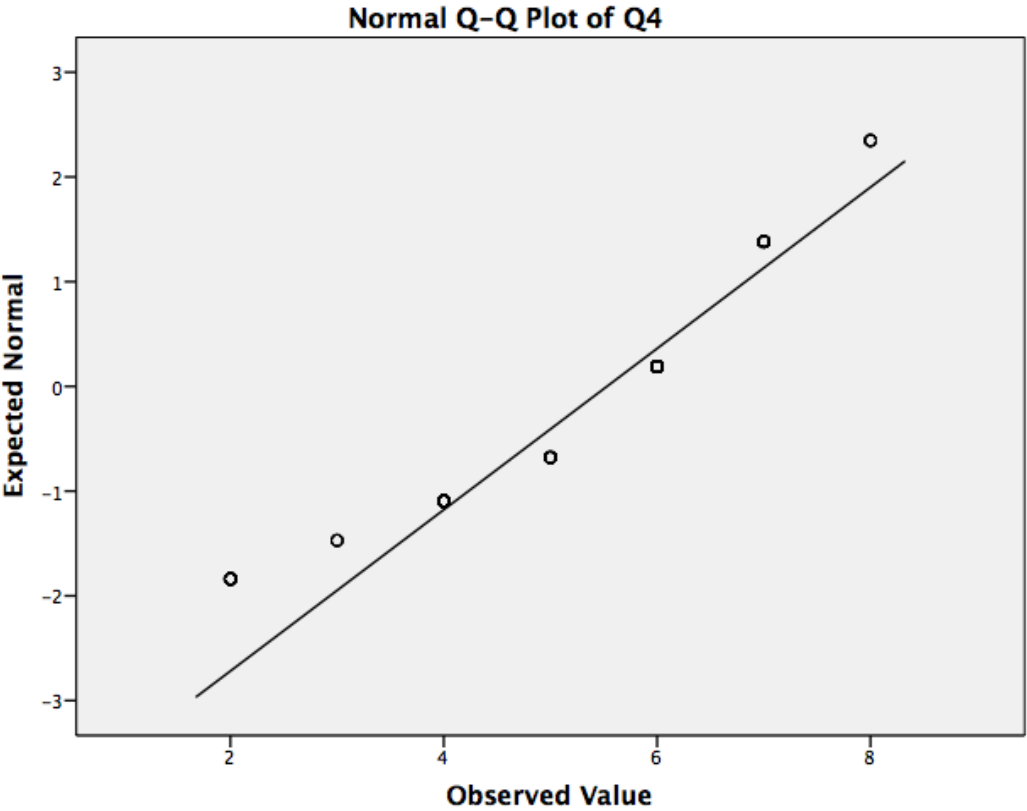
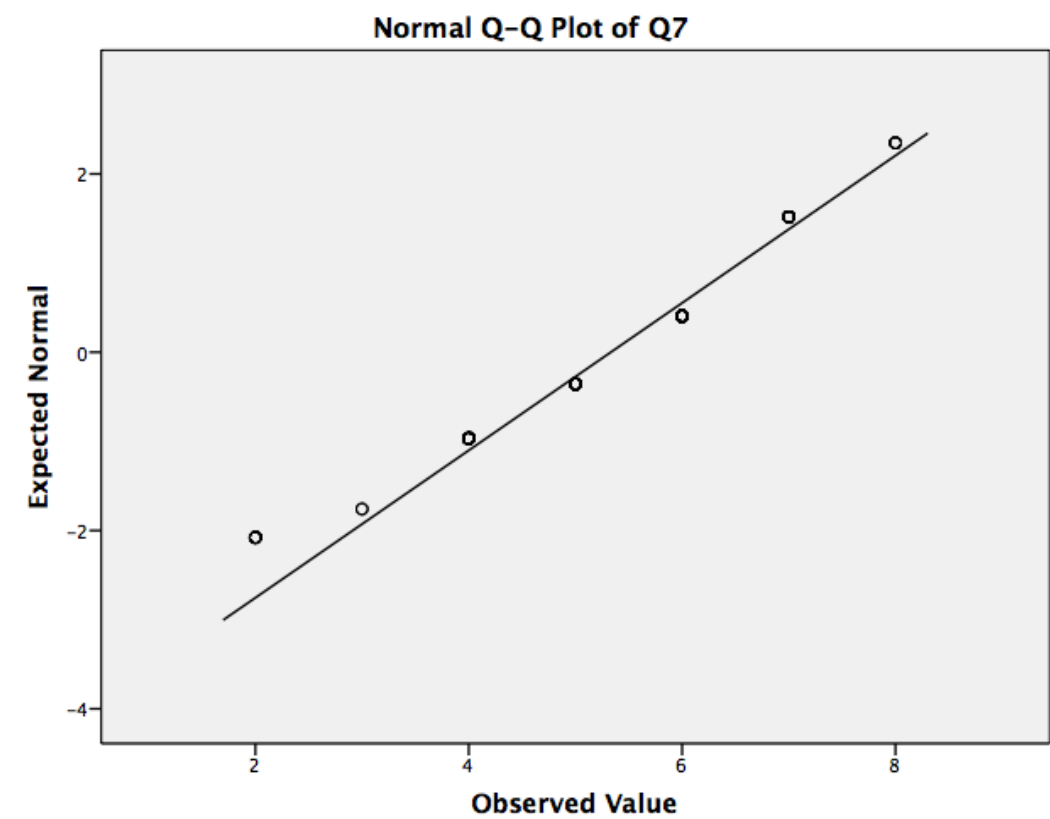




Chart 4.2 Q-Q Plot of the Differentiation-Relatedness Scale on Mother-Description for Normality



Normal Q-Q Plot of Q10

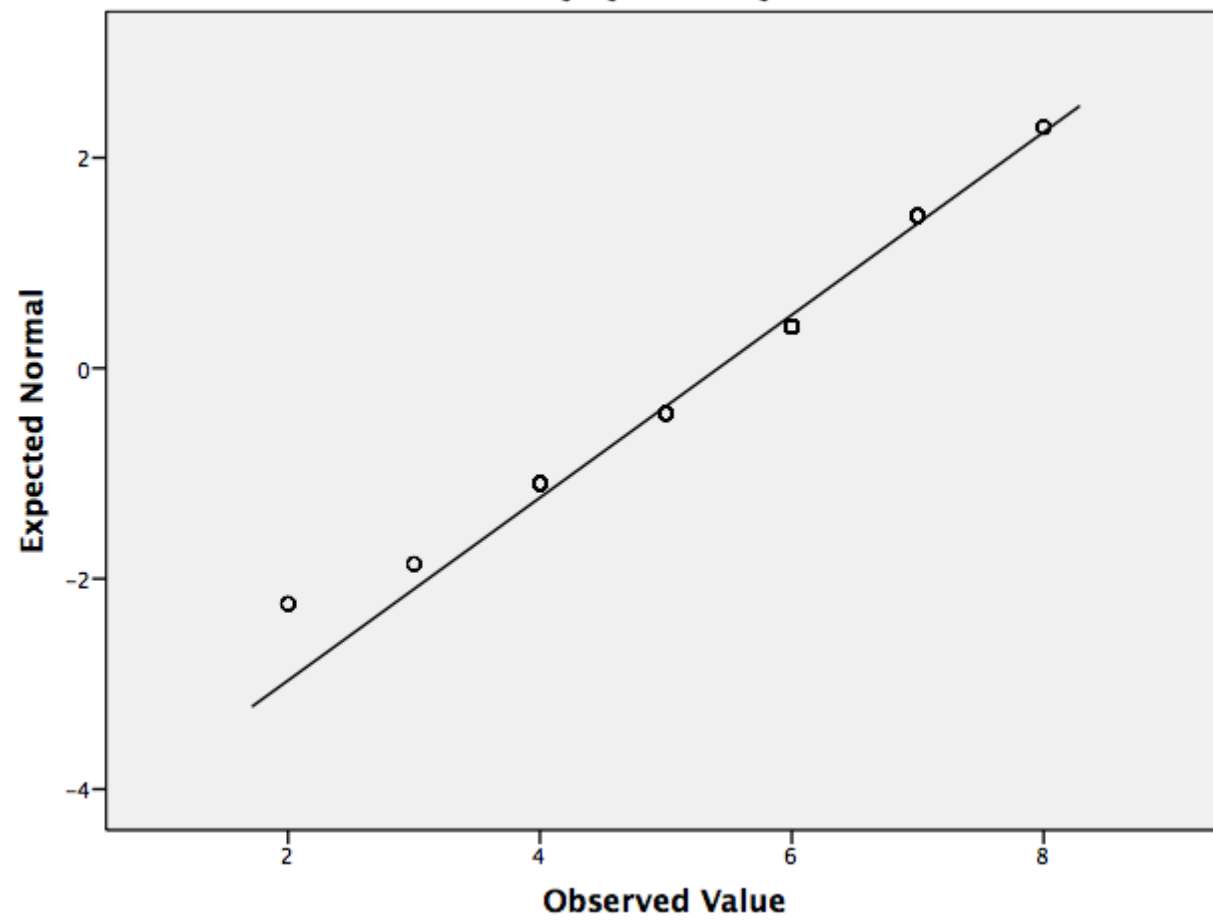


Table 6.11 Kruskal-Wallis Equality-of-Population Rank Test of CAI-DRS scores by gender

		Rank Sum	$\chi^2$ (df)	Probability	$\chi^2$ with tie*	Probability
Self-DRs	Male	25799.00	.02 (1)	.86	.03	.87
	Female	25561.00				
Mother-DRs	Male	25455.50	.07 (1)	.79	.08	.77
	Female	25904.50				
Father-DRs	Male	26703.50	3.04 (1)	.08	3.38	.07
	Female	23699.50				

\* Here tied observations get average ranks when calculating Kruskal-Wallis results

Table 6.12 Multiple Comparisons Results of Post-Hoc Tukey HSD among Ethnic Groups (p values)

		Asian or Asian British	Black or Black British	White	Mixed
Self-DRs	Asian or Asian British	-	.23	.00	.049
	Black or Black British	.23	-	.04	.21
	White	.00	.04	-	.86
	Mixed	.049	.21	.86	-
Mother-DRs	Asian or Asian British	-	.00	.00	.01
	Black or Black British	.00	-	.98	1.00
	White	.00	.98	-	.99
	Mixed	.01	1.00	.99	-
Father-DRs	Asian or Asian British	-	.10	.01	.00
	Black or Black British	.10	-	.01	.01
	White	.01	.01	-	.10
	Mixed	.00	.01	.10	-

		Rank Sum	$\chi^2$ (df)	Probability	$\chi^2$ with tie	Probability
Self-DRs	Asian	706.00	.70 (3)	.87	.83	.84
	Black	1033.00				
	Mixed	2628.50				
	White	41992.50				
Mother-DRs	Asian	900.50	2.79 (3)	.43	3.16	.37
	Black	893.50				
	Mixed	2680.50				
	White	41885.50				
Father-DRs	Asian	975.50	8.498 (3)	.04	9.46	.02
	Black	1101.00				
	Mixed	1802.50				
	White	41572.00				

Table 6.14 Kruskal-Wallis Equality-of-Population Rank Test of CAI-DRS scores by Father's Occupation Status

		Rank Sum	$\chi^2$ (df)	Probability	$\chi^2$ with tie*	Probability
Self-DRs	Unemployed	1049.50	8.46 (3)	.04	10.01	.02
	FT employed	31644.00				
	PT employed	1140.00				
	Self-employed	10122.50				
Mother-DRs	Unemployed	1447.00	3.47 (3)	.33	3.96	.27
	FT employed	30646.50				
	PT employed	1159.00				
	Self-employed	10703.50				
Father-DRs	Unemployed	1327.00	1.99 (3)	.57	2.21	.53
	FT employed	31192.00				
	PT employed	1305.00				
	Self-employed	9836.00				

		Rank Sum	$\chi^2$ (df)	Probability	$\chi^2$ with tie	Probability
Self-DRs	Unemployed	5251.50	5.16 (3)	.16	6.14	.10
	FT employed	18934.50				
	PT employed	16806.00				
	Self-employed	5979.00				
Mother-DRs	Unemployed	5610.50	3.21 (3)	.36	3.66	.30
	FT employed	18430.00				
	PT employed	17180.00				
	Self-employed	5750.50				
Father-DRs	Unemployed	5716.50	1.52 (3)	.68	1.69	.64
	FT employed	17129.50				
	PT employed	17589.50				
	Self-employed	5620.50				

Table 6.16 Correlation Matrix of DRs and Youth's Symptom Inventory T scores within White or White British Ethnic Group (N=138 family clusters)

	Self-DRs	Mother-DRs	Father-DRs
AD/HD, Inattentive	-.04	.01	.03
AD/HD, Hyper-Imp	.05	.15*	.11
ADHD, Combined	.00	.10	.08
Conduct	.04	.02	.00
Oppositional Defiant	.06	.05	.01
Generalized Anxiety	-.03	.09	.02
Separation Anxiety	-.02	-.03	-.04
Schizophrenia	-.07	.00	-.07
Major Depression	-.04	.05	.03
Dysthymia	-.03	.06	.04
Bipolar	.17**	.13	.09
Anorexia	-.08	-.01	-.00
Bulimia	-.03	-.02	-.02
Substance use	.05	.06	.09

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

	Self-DRs	Mother-DRs	Father-DRs
AD/HD, Inattentive	-.12*	-.07	-.05
AD/HD, Hyper-Imp	-.13*	-.02	-.02
ADHD, Combined	-.14*	-.09	-.03
Conduct	-.24*	-.13*	-.08
Antisocial PD	-.22*	-.13*	-.07
Oppositional Defiant	-.16**	-.03	-.09
Generalized Anxiety	-.15*	-.00	-.04
Separation Anxiety	-.06	-.06	-.09
Schizoid Personality	-.24**	-.13*	-.16*
Schizophrenia	-.20*	-.08	-.12*
Major Depression	-.09	.03	-.03
Dysthymia	-.17*	-.00	-.03
Bipolar	-.20**	-.01	-.08
Anorexia	-.16*	.01	-.01
Bulimia	-.13	.01	-.02

*\*\*.* Correlation is significant at the 0.01 level (2-tailed).

*\*.* Correlation is significant at the 0.05 level (2-tailed).

	Rank Sum	Rank Sum	X <sup>2</sup>	p	X <sup>2</sup> with tie	p
AD/HD, Inattentive	10923.00	37593.00	4.99	.03*	5.01	.03*
AD/HD, Hyper-Imp	10467.00	36361.00	1.44	.23	1.52	.22
ADHD, Combined	10749.50	37145.50	4.29	.04*	1.52	.04*
Conduct	10010.00	39445.00	.15	.07	.16	.69
Antisocial PD	10278.00	39177.00	.64	.04*	.71	.40
Oppositional Defiant	10238.00	39217.00	.55	.46	.55	.46
Generalized Anxiety	10238.00	39217.00	1.46	.22	1.48	.23
Separation Anxiety	10345.00	538796.00	.92	.34	1.04	.31
Schizoid Personality	11098.00	38357.00	4.33	.04*	4.57	.03*
Schizophrenia	10630.00	38825.00	1.82	.18	6.27	.01*
Major Depression	9849.50	39291.50	.03	.09	.06	.81
Dysthymia	10653.00	38802.00	1.92	.17	2.98	.08
Bipolar	10082.50	39058.50	.64	.43	.75	.39
Anorexia	10525.50	38615.50	2.23	.13	2.61	.11
Bulimia	10205.00	38623.00	1.68	.19	1.97	.16

*\*\*.* Correlation is significant at the 0.01 level (2-tailed) *.\*.* Correlation is significant at the 0.05 level (2-tailed)